

AMERICAN ARTISAN and Hardware Record

Vol. 84. No. 3.

620 SOUTH MICHIGAN AVENUE, CHICAGO, JULY 15, 1922.

\$2.00 Per Year.

How do you make MONEY?

You can make money by using the cheapest sheet metal you can buy, and by charging the highest price you can get. But that's a poor way to make a lot of money and build a real business.

There is something in every man that makes him do a job to the best of his ability. Many a man who doesn't mind using poor materials puts the best of himself into the work.

How unwise this is. There is no suitable material in the world too good for the hands and brains of a man who knows his job. Of course, you are not going to make gold gutters. It isn't economical even if people would pay for it. Most people can't afford copper.

But we claim that any man in the sheet-metal business should work with "Armco" Ingot Iron. This is

commercially pure iron, soft enough to work well, tough enough to stand the gaff of being formed and shaped.

It is a crime against yourself to put your heart and soul into work with inferior metals except under absolute compulsion.

Tell your customers why you prefer to use "Armco" Ingot Iron—the rust-resisting iron. Show them that the trifling extra cost at first is swallowed up in the years of extra service. Explain that you do good work and can do your best work only with proper materials. Then most of them will allow you to use "Armco" Ingot Iron.

And to use good materials, to do your work to the best of your ability, to charge a fair price that will give a just profit—that is the way to make money.

THE AMERICAN ROLLING MILL COMPANY
Middletown, Ohio

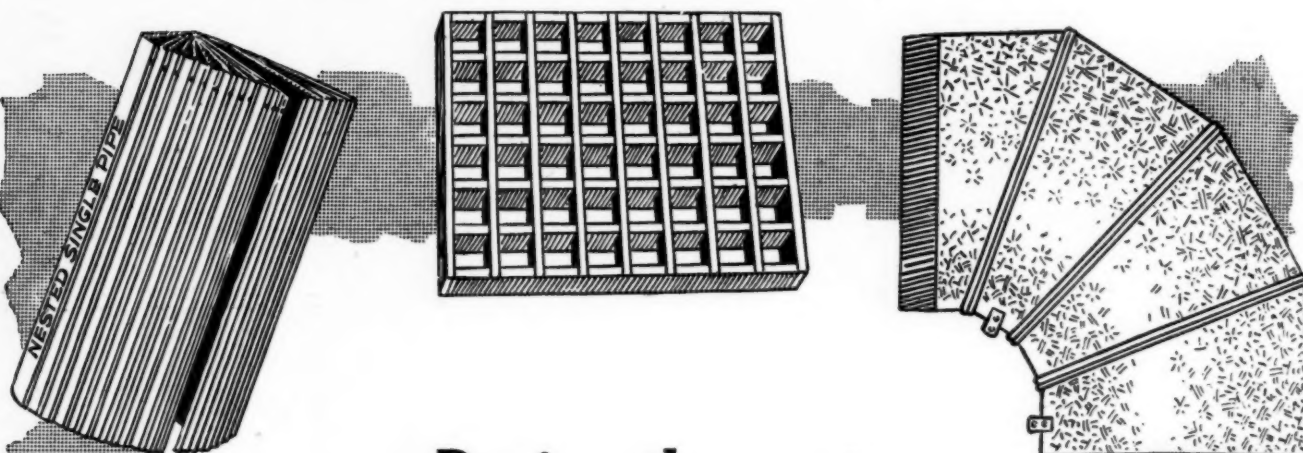


ARMCO

TRADE MARK

INGOT IRON

Resists Rust



**During the next
THREE MONTHS
you must make your harvest!**

Go after every possible bit of business in your territory and remember that "The Handy Pipe People" will take care of all your needs in the way of supplies. Depend on us!

F. MEYER & BRO. CO.
PEORIA ILLINOIS

P. S.—Tin plate and Galvanized sheets have advanced and prices are stiffening. We advise that you stock up on pipe and other needs before an advance comes.



Founded 1880 by Daniel Stern

Thoroughly Covers
the Hardware, Stove,
Sheet Metal, and
Warm Air Heating and
Ventilating Interests

AMERICAN ARTISAN and Hardware Record

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ARE THERE TOO MANY RETAIL STORES?

In a recent issue of Collier's, the question is asked:

"Are there too many retailers?"

And with that question a list is given showing that the number of stores specializing in hardware is 37,032; the electrical stores total 16,703; auto accessory stores, 46,583, etc.

It is reasonable to suppose that in this total of over 100,000 stores selling at retail items which can all be classed as "hardware" there may be some duplications, but for argument's sake they make little or no difference.

The point is that there is one such retail store for every 1,100 people, or using the regular family index of five, one store for every 220 families.

This may not look like too many stores as compared with a total of nearly 400,000 places selling groceries—one for every 55 families.

But the fact of the matter is that we are faced with a really serious situation.

It is not possible for a hardware merchant to make enough net profit on his sales to 220 families to show a fair return for his investment unless he sells about \$100 a year to each family, on a basis of a \$5,000 cash capital. This would give him a net profit of only about \$500, besides his salary as manager.

We venture to say that while yearly sales of hardware to some families may run considerably beyond \$100, in the great majority of cases they amount to much smaller sums.

This simply means that the average hardware store, or store which sells articles classed

as "Hardware" in its wider sense, does not make a profitable return to its owner.

And the one obvious reason for this condition is that there are too many such stores.

What is the remedy?

If a man has an orchard, he goes over each and every tree at certain times and prunes them—he cuts off the superfluous shoots and little twigs which do nothing but absorb the strength that would otherwise be used in producing blossoms and, later on, fruits.

If he fails to prune the trees, they soon lose their fruit-bearing force, and the orchard yields poorer returns every year.

Likewise, a pruning process must take place in the hardware business, and the law of the survival of the fittest does the pruning.

However, it is your job, and that of every hardware dealer who claims to be a merchant, to prove to your community that you are rendering an efficient and economical service. Only by proving this can you hope to avoid the pruning shears of the thing which we call "Failure."

Many of the stores operating as "exclusive" automobile accessory or as electrical supply retail establishments would not have been opened if the hardware dealer in the particular neighborhood had been "on the job," for if he had really been up and doing he would be selling the automobile accessories, the washing machines, the electric irons, toasters and hundreds of other kindred articles that are now sold by these specialty stores.

Random Notes and Sketches.

By Sidney Arnold

Robert Kerr, Secretary of the Clayton & Lambert Manufacturing Company, told me the following story during my recent visit at his office in Detroit:

Sam had passed through a harrowing experience. He had seen no less a thing than a ghost. While his audience listened with bulging eyes, he related the details of his awful experience.

"Ah'd jes' come outer de cow pen whah Ah'd been milkin' de cows," he said, "an' Ah had a bucket o' milk in mah hand. Den Ah hears a noise by de side o' de road an' de ha'nt rushes out. Looks like it's a man wid his haid chopped plum' off, an'—"

"Lawd!" interrupted one of his auditors, "'at suttinly must of been terrible. Didn't yo' shake wid fright, Sam?"

"Ah don' know what Ah shook wid. Ah kain't say fo' suttin Ah shook at all. But when Ah got home Ah foun' all de milk gone an' two poun'd o' butter lef' in de bucket."

* * *

"I do not know whether to classify this man as a mean cuss or whether he is just foresighted," said S. D. Vale, Salesmanager and Secretary of the Orbon Stove Company, about a man who had recently been married.

The fellow had bought his bride a ten-cent bag of candy for a wedding present and took her for a honeymoon trip on the trolley. When they alighted from the car a couple of pieces of candy still remained in the bag.

"What shall we do with it, dear?" she asked.

"Better not eat it all," he advised prudently. "Let's save some for the children."

* * *

Here is a good one from the storehouse of Jim Robinson, vice-president of the Hart & Cooley Company:

Jim was visiting at the country home of one of his friends, the little granddaughter of the friend came running up to the two who were enjoying themselves with something served in tall, thin glasses, and asked if Grandpa would not please come and help her and Brother Johnny fix their coaster.

Grandpa and Jim went with the youngster and arriving at the scene of the accident, the former asked Johnny what he was expected to do to help.

"Oh," was the answer, "I just wanted you to say some of the words you say when you are fixing your automobile. Mama won't let me say them."

* * *

Charlie Gohmann of Pointer Range fame was a passenger some time ago on a train in the Southwest which was running on a very irregular schedule and was falling way behind that.

On one of his trips through the smoking car, the conductor was accosted very courteously by Charlie with the request for information as to the lateness of the train.

"Well, sir," explained the conductor genially, "the train in front was behind, and this train was behind before, besides."

* * *

I am looking forward to greeting once more the Grand Old Man of the Michigan Sheet Metal and Roofing Contractors' Association—"Doc" Weatherly, of Grand Rapids, during the annual outing of the Association next week, part of which will be spent in Chicago.

"Doc" says that Grand Rapids is a good town to live in, and he gives as a reason (on a post card just received) that he lives there.

At that, he may not be so very far off in his statement, for a "real furnace man" is surely one of the necessary institutions of a good community.

Here is one of the trade-marked, patented and copyrighted stories of the one and only Samuel Happy Jacobs, Vice-President and General Salesmanager of the Fanner Manufacturing Company:

An Italian laborer was applying for naturalization papers, and to test his qualifications the judge asked:

"Who is President of the United States?"

"Meestaire Harding."

"Correct. And who is vice-president?"

"Meeses Harding."

"N-n-no, that will hardly do," replied the kindly judge. "But I will give you another chance. What is to prevent your becoming President?"

"Ah-ha!" chortled the laborer in triumph at such an easy one. "I gotta you dere, judge. Me too busy. No gotta da time."

* * *

There may be worlds beyond our view,

Where jealousy is never known,
Where merit always gets its due
And men are judged by worth alone.

Where fragrant winds are always blown,

Where no man does another ill,
Where each is sure to reach his goal,

Where no one serves a master's will,
And all are free in thought and soul.

No matter if such worlds there be;

I find that life is pleasant here,
Where others, with fond faith in me,

Are glad because I bring them cheer;

I help to make their pathways clear,

I coax the sparkle to their eyes,
And am rewarded by their praise;
If other worlds float through the skies,

From this I am content to gaze.

—S. E. Kiser.

* * *

It is easier to find a fault than it is to lose it again.

The Latest News About Stoves and Ranges

Items and Discussions of Interest to the Manufacturer and Retailer of Kitchen Ranges, Heating Stoves and Accessories.

Use of Electric Ranges Is Increasing Rapidly.

About 140,000 electric ranges are in use in the United States today compared with 10,000 in 1915. It is estimated that at least 54 per cent of these ranges are installed west of the Rocky Mountains. About 6,000 communities with electric service have special electric cooking rates. This gives clean and economical cooking facilities to many where gas is not available.

The records of the Associated Manufacturers of Electrical Supplies show that 21,739 electric ranges were manufactured in 1919 and 41,000 in 1920. Last year it is estimated 30,000 electric ranges were installed and this year it is predicted 100,000 will be sold.

Specialization Increases Output and Sale of Kitchen Ranges.

In catalog number 17 issued by Gohmann Brothers & Kahler Company, New Albany, Indiana, President Charles L. Gohmann makes the following significant announcement, referring to his statement of 1919 as to specialization on a limited number of styles in kitchen ranges:

"In our announcement to you of November, 1919, we called attention to our entirely new system in range building. Our experience at that time only covered a period of a few months, nevertheless, this short test in specializing proved to us beyond a doubt that there were wonderful possibilities in this method of range making. Better ranges for less money are the final results of this method and the strongest evidence that we have to prove this statement is the fact that our factory's output has in this short space of time been increased from seven thousand to thirty thousand complete ranges annually."

It would seem that there is food for thought for the manufacturer who is urged by his salesmen to make this or that additional type in order to compete with some other make of ranges, as well as for the retailer of this class of goods who is carrying half a dozen different makes on his floor.

Unnecessarily large variety of styles increases unduly the cost of making, the expense of selling for the manufacturer and therefore also increases the cost unduly to the merchant and the consumer.

Says AMERICAN ARTISAN Editorial Is a Good Sermon.

Harvey J. Fueller, Abington, Pennsylvania, who represents the Detroit Vapor Stove Company in that state has this to say about the editorial which was published in the

July 8th issue of AMERICAN ARTISAN AND HARDWARE RECORD, the title of which was, "Take Your Customers Into Your Confidence":

TO AMERICAN ARTISAN:

Your article in the July 8th issue, entitled "Take Your Customers Into Your Confidence," should be read by every retail merchant in the country; the merchant who does not read it, is missing something.

It is a fact that the public is to a large extent unfriendly to the retailer.

The retailer, on the other hand, is so thoroughly inoculated with the same virus that he believes that the manufacturer is gouging him.

You are preaching a good sermon. Keep it up.

Sincerely,

HARVEY J. FUELLER.

Abington, Pennsylvania,
July 11, 1922.

California Stove Merchant Uses Three Colors to Advertise Gas Ranges in Newspapers.

The Striking Appearance of the Advertisement Made it Certain That Many More People Would Read it.

F. L. BUTTERFIELD, 2169 F. Shattuck avenue, Berkeley, California, is a progressive and aggressive retail hardware merchant, sure enough.

He believes in advertising.

He believes that a hardware store is the proper place for the sale of gas ranges.

And he believes in these two facts strongly enough to use extraordinary means in order to induce people to come to his store to buy gas ranges.

The particular circumstance to which attention is called here is the fact that recently Mr. Butterfield ran an advertisement in the *Berkeley Daily Gazette*, two columns wide and seven inches deep, and

that this advertisement was printed in three colors!

A reproduction of this announcement is shown herewith in slightly reduced size.

The Lorain Oven Heat Regulator cut in the lower right hand corner was in red, as well as the name "Clark-Jewel," while the dress of the woman and the little box below the cut of the range, containing the statement, "Cooks Whole Meal at One Time," were in blue.

There is just enough text matter, and of the proper kind, to make the reader curious to find out just how it may be possible to put a whole meal in the oven and have it all perfectly cooked at a certain time without having to pay any at-

tention to the roast, the pie, the pudding, or anything else in the way of cooked food until the time determined on—and, of course, when Mrs. Jones comes in, either Mr. Butterfield or one of his ef-

out some facts in regard to the steady increase in gas consumption and the great growth of the gas range business as well as the great possibilities for further development in this field for the hard-

poses, or about one million two hundred thousand households.

In 1898 the average consumption of gas was 726 cubic feet per capita. In 1915, the corresponding figure was 2,648 cubic feet, and in 1920 the average was nearly 4,000 cubic feet.

These figures are exceedingly interesting because they point out the steady increase in gas consumption, which is only another way of saying that they indicate a wonderful growth in the sale of gas ranges, as well as the tremendous field there exists for future sales.

Take the matter of replacement only—based on the total number now in use—what a wonderful market for the hardware merchants who sell gas stoves and ranges!

Building Permits in Chicago Break All Former Records.

The total value of buildings erected or contracted for in Chicago during the first six months of 1922 amounts to \$111,502,310, or half a million dollars more than during any corresponding period since 1912 which was the banner year.

The number of permits was 6,825. June is highest in number of permits with 1,419, but May shows the highest value with \$27,029,650 as against \$26,576,850.

It is worthy of note that during May and June, contractors operating under the Landis Award secured 82 per cent of all contracts reported.

Portsmouth Stove & Range Company to Enlarge Plant.

The Portsmouth Stove & Range Company, Portsmouth, Ohio, has let a contract for a plant addition to cost about \$100,000.

One would learn to talk well—also when it is well not to talk.

When a business is young it requires nourishing; when it is old it requires watching; but young or old, there's never a time when it does not need pushing.



CLARK-JEWEL

GAS RANGE

with the **LORAIN**

OVEN HEAT REGULATOR



With this Wheel (the Fairy Regulator) on your Range "Every afternoon is an afternoon off." It measures the heat.

ADVANTAGES OF THE "LORAIN"

THE "LORAIN" Oven Heat Regulator maintains any desired degree of heat in the oven indefinitely. Thus after the proper degree (notch) on the Temperature Wheel is determined. THE RESULTS WILL ALWAYS BE THE SAME when the Wheel is set at the same notch. You still have all the advantages of a gas range. The advantages of the "LORAIN" Oven Heat Regulator are all additional. THAT IS, YOU ENJOY THE ADVANTAGES OF TWO DEVICES IN THE SPACE OF ONE.

We are showing many new models of Clark-Jewel Gas Ranges. Don't buy until you have examined these wonderful Gas Ranges.

ONE EASY TURN

of the red wheel of "LORAIN" gives you the choice of 44 precise oven heats. This wonderful invention enables you to measure the oven heat so easily and accurately as you measure a cup of sugar.



Two Column Newspaper Advertisement Printed in Black, Red and Blue.
Published by F. L. Butterfield, Berkeley, California.

ficient salespeople will explain every detail of the ingenious device which makes this possible.

And the explanation will be so convincing that Mrs. Jones will hardly stop to consider the small additional cost of the Lorain Oven Regulator, which means that the sale will be larger and that the net profit on the sale will be greater.

While we are on the subject of gas ranges it might be well to point

ware merchant who is "on the job."

There are approximately 4,600 cities, towns and villages in the United States which have gas service.

Nearly nine million individual customers are carried on the books of the various gas companies. Approximately six million people in urban localities are not using gas for either cooking or lighting pur-

Unusual Methods of Displaying Merchandise Always Draw the Public's Attention.

Herewith Are Shown Two Unusual Window Displays of Summer Articles Which Help to Increase Business.

ANYTHING that is out of the ordinary will generally draw the attention of the public.

A giant or a dwarf always have a flock of youngsters following them.



Unusually Fine Window Display of Refrigerators. Arranged by Edward Travers for Alex Grant's Sons, Syracuse, New York.

A barrel full of beer with a spigot ready for use in it, left on the corner of a busy street is sure to draw the attention of a lot of people.

And so it is with the matter of window displays.

Refrigerators are very prosaic and to the ordinary hardware salesman is not particularly attractive as the subject for a window display.

But take a look at the window display shown in the first illustration herewith.

You will admit that here is a manner of treating this prosaic subject in a very unusual and, therefore, very effective way.

It took some ingenuity to plan this display, and it could not be arranged without some expense, nor without using quite a bit of time.

But we venture the guess that Alex Grant's Sons, the progressive hardware merchants at 134 Genesee street, Syracuse, New York, were well satisfied with the results from this highly artistic and very unusual window display of refrigerators.

We quote from the letter written by Edward Travers, who planned and arranged this window display:

"A platform was made of heavy lumber sixteen inches square; to this was fastened a circle shaped

board of oak, also sixteen inches in diameter, and a three-inch circle of wood was nailed on top of the first circle.

"Above this I constructed a platform, five feet across, made of com-

"The two circles were used as pulleys and were connected with an electric motor, which was hidden by the large 'cake of ice' on which the polar bear to the extreme left stands, and by these means the other two polar bears kept 'walking' around the refrigerator.

"The icebergs were made of composition board and painted green and white to produce the proper effect. The 'cake of ice' was a box painted in similar manner.

"The two figures in the background represent Jack Frost bearing trays loaded with vegetables, fruits and cooling drinks.

"In the foreground are show cards telling about the Lenard porcelain, cleanable refrigerator and also sections of same showing its construction."

The second illustration is a reproduction of a window display arranged by the well known artist, Otto J. Gress, for the Bunting Hardware Company, 810 to 814



Attractive Window Display of Bathing Apparel. Arranged by Otto J. Gress for Bunting Hardware Company, Kansas City, Missouri.

position board stiffened with cleats.

"In the center I placed a one hundred pound keg of lead, on top of which the refrigerator was located.

"Two polar bears made of papier maché were placed, one on each side of the refrigerator.

Walnut street, Kansas City, Missouri.

Recently we showed another of Mr. Gress' window displays which had for its subject that of bathing suits. Living models were used at that time.

This illustration shows another very effective manner of treating the same subject. It was, like the first, one of a series of four featuring the same general lines and preceded the display first shown.

Mr. Gress describes this artistic window as follows: "A real sandy beach with painted background showing inviting water, with a realistic pier and a big pavillion on the right hand side; in the center were sail boats and steamers at the left.

"The incoming waves dashed on the painted beach in the immediate foreground and seemed almost to roll on the sandy beach which was built in the window.

"The left side of the window was decorated with a striped umbrella over a small table and the right hand side showed a little beach tent through which the bathing girls came, when they entered the window.

"Striking posters, furnished by manufacturers advertised caps and other bathing apparel; a few suits, etc., were displayed on stands, and two large show cards announced that on Friday and Saturday living models wearing bathing suits would appear in the window."

It is safe to say that there were crowds in front of both window displays here described. They were unusual. They treated their subjects in a different and interesting manner. It always pays to do the ordinary thing in an extraordinary way when it comes to advertising.

People are always more likely to pay attention to what you say or do if you say or do that thing in a manner to which they have not been accustomed.

And in the summer time, what more attractive method of attraction can you think of than suggesting coolness?

It finally occurred to some inventive genius to put a partition between the ice compartment and the food chamber, this partition having an opening in the top and bottom, which for the first time introduced the principle of the circulation of air within the refrigerator.

I remember quite well how I stared in boyish wonder at a revolving paper pin-wheel which could be seen through a special glass door in the refrigerator.

By this means the manufacturer of the refrigerator demonstrated the circulation of air in this type of refrigerator, and to me it seemed almost like perpetual motion.

I clearly remember some of the talking points that were used in those days for this type of refrigerator.

One was, that matches if kept in the refrigerator could be lighted, for in those days we had the sulphur matches, packed in small oval boxes, which were difficult to ignite even under the best of conditions.

Another argument the salesmen used was that salt would not cake if kept in the refrigerator for it would remain perfectly dry.

Another claim which was made for this type of refrigerator was that the flavor of one food would not be contaminated by the odor of other foods.

In other words, fish, butter and onions could be placed in this refrigerator without the butter being contaminated by the odor from the fish or onions, because of the circulation of the air.

It was only necessary to place the butter close to the incoming pure air and the highly odorous foods higher up in the refrigerator in order to prevent mixing the flavors.

All odors passing over the ice would be absorbed and pass out through the drain, allowing the purified air to continue circulating from the bottom of the ice compartment.

It was recognized that the ice compartment should be kept as sanitary as the food compartment and the wooden sticks covered with cor-

The Evolution of the Home Refrigerator Is Due to the Application of Scientific Facts.

Commercially Pure Iron Is a Big Factor in Furnishing the Right Surface for the Vitreous Enamel of the Cooling Chambers.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by
James A. Aupperle, Chief Research Chemist, The American Rolling
Mill Company, Middletown, Ohio.

THOUGHTS of means for keeping food cool and fresh in the early days brings to mind "the old oaken bucket which hung in the well," only this was a food bucket which was lowered in the well to keep the food cool and fresh. It was the first refrigerator within my memory.

Probably no development of home convenience has been more pronounced than the evolution of the old-fashioned ice chest into the modern refrigerator. Even at the present time refrigerators of very simple construction are used in hot and dry climates.

The principle of construction is a simple metal frame covered with burlap and supporting an iron pan. The hotter and drier the climate

the better this simple method of refrigeration.

The cooling depends upon water seeping from the iron tank to the burlap sides of the refrigerator, thus keeping the cloth moist.

The hot dry air causes evaporation of this moisture and produces satisfactory refrigeration. During wet weather this type of refrigerator is not so efficient.

The original home ice chests were crude affairs constructed of wood both inside and outside consisting principally of a box with a hinged top, the insulating material being sawdust.

In this type of ice chest the food was at first placed directly on the ice, then later an improvement was made with shelves on the side.

rugated iron were replaced by an all metal ice rack. This added another element of cleanliness to the refrigerator.

The walls of the food compartment in the later refrigerators were lined with galvanized iron and from galvanized iron the manufacturers turned to the use of opal glass and tile linings.

This type of construction had some objectionable features, such as high cost, frequent breakage of the glass, and the opening of joints in the tile linings.

In the construction of the best home refrigerators, care is exercised to use the best insulating medium obtainable in order that the refrigerator may be always at its maximum efficiency. Of all insulators, vacuum heads the list, and while no vacuum walled iron refrigerators are yet in use, on the principle of the vacuum bottle. Still I believe it will not be long before this vacuum principle is used in the construction of refrigerators.

Some dairies now use enameled iron vacuum tanks for the transportation of milk as it is possible to keep milk at a nearly constant low temperature when such containers are used.

In the average home refrigerator cork, charcoal or sawdust is used as an insulating medium, cork heading the list in insulating value.

One of the greatest advancements in refrigerator construction, consists of the use of vitreous enameled iron linings, made possible by the discovery of the manufacture of commercially pure iron made in open-hearth furnaces.

It was found that by super-refining the metal in an open-hearth furnace, the solid and gaseous impurities were eliminated and that a large amount of the trouble encountered in enameling the average steel was overcome.

Enameled steel contains a large number of pinholes, blisters and other imperfections of which the most serious is buckling, warping and distortion when heated to redness in the enameling operation.

Commercially pure iron on account of its dense and homogeneous nature does not warp or buckle when enameled.

This is a highly important factor in high grade refrigerators. The high quality of vitreous enameled commercially pure iron is proverbial among enamelers.

Another defect found in steel when used for the enameled parts of refrigerators is the tendency of the enamel on steel to break from the metal in the shape of fish-scales, which are unsightly spots.

The glossy surface of steel also permits the enamel to chip off, as steel has not the enamel holding properties of iron.

The fish scaling of steel has been attributed to many causes. Some believe it is due to a difference in the expansion between the enamel and sheet metal, and that the fish scaling occurs because the metal has contracted so far as to place the enamel under compression. It has also been said that fish scaling can be caused by absorption of hydrogen from pickling the sheet metal prior to enameling either too long or at too high a temperature.

Others have attributed the fish scaling to the acid content of the enamel being too high.

A large amount of fish scaling trouble has been found to be due to imprisoned gas in the metals.

It rarely occurs on commercially pure iron which is thoroughly degasified.

Another important consideration in the use of metal used for vitreous enameling for refrigerators is the fusibility of the enamel onto the iron; steel being harder than iron, and on account of its highly polished surface, does not hold the enamel so well as commercially pure iron, and it is liable to chip off.

This is due to the fact that commercially pure iron is soft and has a velvety surface which roots the enamel in the fusing process.

In a discussion of the enameled parts of refrigerators the difference between vitreous enamel and ordinary paint enamel should be clearly borne in mind.

Vitreous enamel is a material similar to glass fused onto the metal at a bright red heat and is as permanent as the iron itself, while other enamels are applied with a brush from which the solvent escapes.

Starting with "the old oaken" food bucket and ending with the enameled iron refrigerator of the present day there has been considerable evolution in devices for the refrigeration of food.

The modern home refrigerator made from enameled iron is an article of beauty, serviceability, and efficiency to the housewife.

Science is entering the field and already thermostatic control has been brought into the home to regulate the temperature in the iceless refrigerator.

The liquefied gas is allowed to pass into coils in the refrigerator where evaporation of the liquid takes place, thus producing cold.

This expanded gas formed from the evaporation of the liquid is then returned to the motor driven compressor and liquefied and used over again, none of it evaporating into the air.

Thus we find science concerning itself with the problems of the home, and the busy housewife on her part appreciates the many conveniences which science has brought into the home.

From the point of view of health, sanitation, and maximum efficiency in refrigeration, the modern refrigerator has marked one of the greatest advancements in household economics.

President Casey Will Serve on Save Surface Committee.

It is announced that C. H. Casey, Jordan, Minnesota, the newly-elected President of the National Retail Hardware Association, will represent the retail hardware interests on the National Save the Surface Committee.

The activities of the Save the Surface Campaign have been conducted in the interest of all units of the paint trade, and all units are

financially supporting the campaign on a definite basis. Hereafter it is expected that retailers, master painters, jobbers and manu-

facturers will be represented at meetings of the National Save the Surface Committee.

The last meeting of the commit-

tee was held in Cleveland on June 16th, and the next one will be held the latter part of August or early in September.

Suggestions and Plans for Window Displays.

Instructive Examples from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

BASEBALL DISPLAY THAT PAID IN SALES.

The window display of baseball goods shown in the accompanying illustration was arranged by Anton M. Krema for the Prange-Geussenhainer Company, Sheboygan, Wisconsin, and was submitted by him in the recent Window Display Competition held by AMERICAN ARTISAN AND HARDWARE RECORD.

In the following, Mr. Krema describes how he arranged the display, closing with the statement that the resulting sales were large enough to more than pay for the time and labor spent.

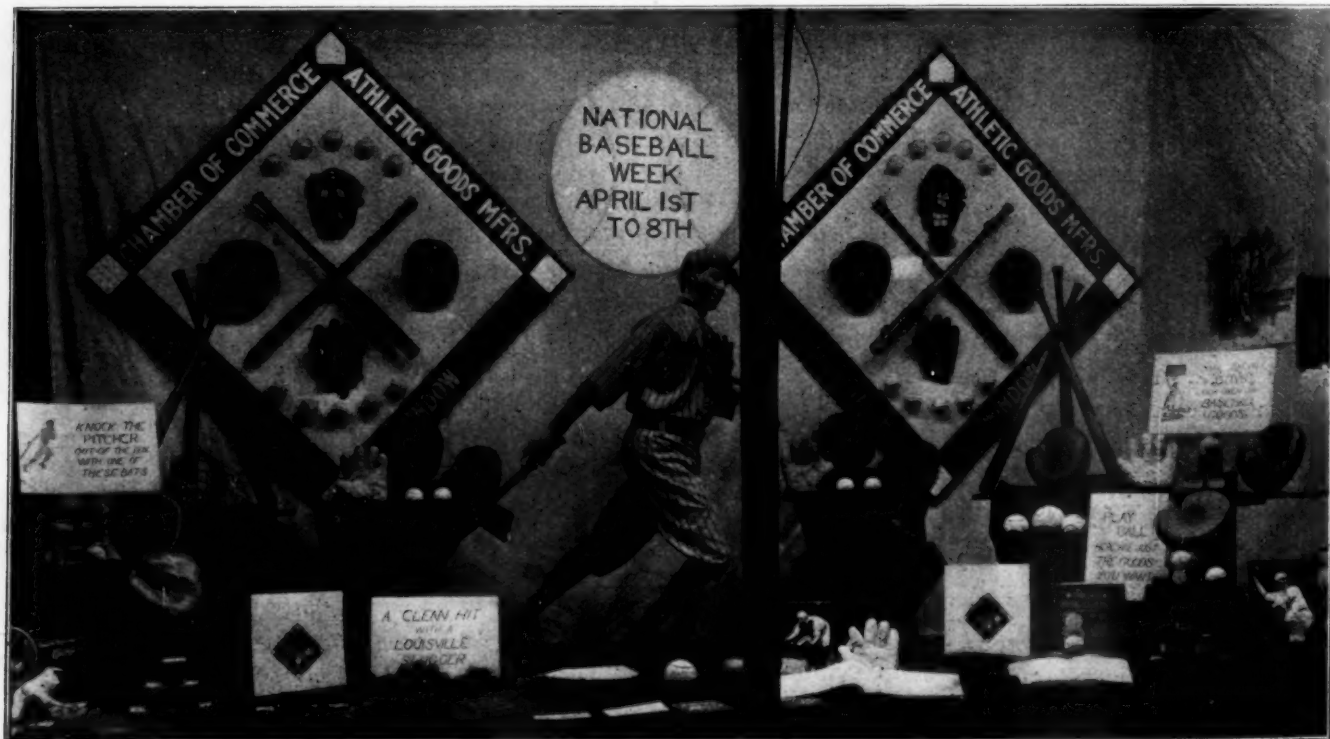
"Baseball is one kind of a display that never fails to win wide attention and cause unlimited comment.

"This is a real baseball window display. There is something wonderfully fascinating to most intelligent people, in an old time baseball game. As we grow old we forget many outdoor sports that we have participated in, but when it comes to baseball, our youth soon comes back and how pleasing it is to see Dad pitch a ball to his son on the lawn, and loosen up some of his muscles. There are many out-of-door games that men and boys find a pleasure in, but we can frankly say that every man or boy has participated in baseball some time of his life. Taking this in consideration we find it logical to make up a real baseball window display early in spring and stimulate the old time sport that we once enjoyed.

"When Mr. Jones passes our store and inspects our window display of baseball goods, it will be easier for his son John to get permission to buy the glove which he already has selected from our display.

"I have experienced this instance when I questioned a young lad who came into our store to buy a certain glove that he had selected from our window.

"An exclusive baseball window display impresses the people by bringing to them a showing of the goods that the player, professional, amateur and juvenile, uses in playing the most popular of all American outdoor games, "baseball." The public sees the goods and gets a much more intimate relationship with them. The people who use



Exceptionally Effective Window Display of Baseball Goods. Arranged by Anton M. Krema for the Prange-Geussenhainer Company, Sheboygan, Wisconsin.

baseball goods at once get the fever of possession and buy; and many who never before bought, become inoculated with the general interest being shown in the display and buy also.

"Now enters the question of skill and ability upon the part of the window trimmer; beyond merely presenting goods in a window for the purpose of describing them, they must be arranged in such a manner as to answer the purpose of advertising. A good window display must, 1st, arrest attention, 2nd, arouse interest, 3rd, create a desire to possess which should lead to, 4th, a resolve to buy.

"In arranging this display we felt the necessity of some device of human interest, for holding the attention of the passersby, a sufficient length of time to present his message concerning the baseball goods. We succeeded in accomplishing the purpose by showing a figure in a running position, as if he made a clean hit and is getting away to first base. Much study was given to the arrangement of the merchandise, each and every article was placed so as to show all its merits. Much care was taken not to crowd the goods displayed. The material used in making this display consists of a sky blue cloth for background, two wall board squares hung so as to represent a baseball diamond, were displayed with one catcher's mitt, first baseman's mitt, catcher's mask, fielder's glove, bats and balls, which complete an outfit to play a real game of baseball. A large baseball also of wall-board was fastened between the two baseball diamonds centered with the lettering, "National Baseball Week, April 1st to 8th," which was nationally advertised.

"Pedestals were used, which were draped with green plush; on them were carefully arranged baseball goods, also a few attractive show cards were used to interest the passersby.

"A display of this sort does not only make direct sales. It causes a great deal of talk that results in a kind of publicity which

creates interest and serves the practical purpose of general advertising that helps the store.

"The sales resulted from this window display were more than enough to repay us for all the care and thought, which we bestowed upon its arrangement."

Freight Claims Should Be Filed Inside of Four Months.

Every shipper or receiver of freight should know that a bill of lading contains a time limit in the making of a claim, and the beginning of suit, if the claim is not settled. It has been a favorite practice of railroad companies to jolly claimants along until the time limit has expired, and then refuse to pay it.

One case in point was where the shipper sent from the factory to another city, to themselves. They entered suit without filing a claim. If you do not file your claim within four months, you have lost your right to damages unless you can show the goods were made away with, either because of the railroad's delay, or because of the railroad's negligence en route, or because of something occurring during the loading or unloading. You might get by with a defense of this character, if you can prove it, but the one safe way to protect yourself in every possible contingency, is to file your claim within four months, even though your claim seems certain to be settled almost immediately.

P. & F. Corbins' New Catalogue Is Conveniently Arranged.

Catalogue Number 26 of the P. & F. Corbin division of the American Hardware Corporation, manufacturers of builders' hardware, has just been issued and will be found a very useful handbook for the hardware merchant.

Locks come first, followed by lock fittings and accessories.

Then come lock sets, door handles and exit fixtures, after which are listed such items as letter drop plates, butts, push plates, etc.; then

window hardware, transom fittings, etc., all grouped together in a manner to make the book very easy to use when figuring with a prospective customer.

Hardware Salesmen Are Not Paid Unduly High Salaries.

The United States Chamber of Commerce has issued a compilation of records of the Harvard Bureau of Business Research pertaining to the ratio between the salaries paid to retail salesmen and the net sales in various lines.

This statement shows that drug salesmen's salaries average highest of the five lines investigated.

Next in line comes the shoe salesman, followed by the jewelry salesman, after which the hardware man is placed, the lowest being the groceryman.

The highest proportion for hardware is 16 per cent paid out in salaries; the lowest about 2½ per cent, with slightly more than 6 per cent being the "common" rate, which, however, is not to be taken as the "average."

Tells How to Gain Good Will of Women Customers.

Speaking to the convention of the Associated Advertising Clubs of the World in Milwaukee, Wisconsin, Anna D. Oleson, recently nominated for the United States Senate from Minnesota, gave some practical suggestions for gaining the good will of women customers. She said:

"Women may flatter themselves in being shrewd purchasers by buying items for 99 cents, \$7.77 or \$14.97, but nevertheless, the big thing we seek is honest value, which is a fair price for a fair product. When we get that, we will come again, if we do not get it, we will not come back.

"It is a strong point with us, that a firm will refund us the purchase price of anything bought, if it does not prove satisfactory.

"We may never return the article, but the fact that the retailer stands back of his goods, gives us

a sense of assurance, which will always react in favor of the dealer who makes that a part of his business practice."

Numerous intimate sidelights into feminine preference were offered by the speaker.

"In purchasing a piece of furniture or in the selection of a dress, the modern woman wants utility to be sure, but in addition she asks for attractiveness and artistic appearance.

"The rough hewn bench of a hundred years ago, was strong and durable, it would fully serve the need for sitting down, but the modern woman seeks to get something that will serve the same purpose, and in addition to this she asks for beauty and comfort in order to have a home atmosphere equal to that of kings and queens, a few centuries ago. In the selection of a garment, a blue denim dress would be very serviceable, but the modern woman asks that her garments shall also add beauty to her appearance. In the selection of food, women hope to have what may be agreeable to the palate, as well as nourishing to the body.

"Not all the advertising is in print, in fact the most valuable is not on the sign board or on paper.

"We women like what may be called 'atmosphere.' Our sense of intuition is highly developed. We like to buy, where we feel we are welcome, and where we are appreciated.

"Therefore, courtesy, promptness of service, forethought of personal comfort such as drinking fountains and rest-rooms, have their value.

"We like to be waited on by men and women of good address and worth-while purpose in life.

"This kind of making for home comforts, may well be considered as a form of advertising. It makes us want to do our business where we find it."

Uses Clever Method to Show Covering Capacity of Paint.

When you speak of comparative covering capacity, opacity, fine

grinding and other terms familiar to the paint man, beware of "talking over your customer's head."

A merchant in Dallas who has built up a prosperous trade on a high-grade line, makes a graphic and quick comparison of the difference between the finely ground and the coarsely ground paint, in a manner that convinces many obstinate customers.

A shallow wooden box 6 inches square is divided into halves, in one section of which is placed No. 6 BB shot and in the other No. 2 BB.

The top is covered with glass. Equal volumes of shot are used and when the box is laid flat and the shot seeks its level, the difference is immediately detected.

The fine shot covers fully a third greater surface area than the coarser—making a graphic argument for the higher grade paint with its finer grinding.

Coming Conventions

Master Sheet Metal Contractors' Association of Ohio, Zanesville, Ohio, July 18 and 19, 1922. W. J. Kaiser, Secretary, 123 East Chestnut Street, Columbus, Ohio.

Annual Outing of Michigan Sheet Metal and Roofing Contractors' Association, July 25, 26 and 27, to Grand Rapids, Chicago and Milwaukee. Frank E. Ederle, secretary, 1121 Franklin street, Southeast, Grand Rapids, Michigan.

Sheet Metal Contractors' Association of Pennsylvania, Hotel Lawrence, Erie, Pennsylvania, July 27 and 28, 1922. W. F. Angermyer, secretary, 714 Homewood Avenue, Pittsburgh, Pennsylvania.

Western Implement, Vehicle and Hardware Association, Kansas City, Missouri, January 16, 17, 18 and 19, 1923. H. J. Hodge, Secretary, Abilene, Kansas.

Texas Hardware and Implement Association, Dallas, Texas, January 23, 24 and 25, 1923. A. M. Cox, Secretary, 822 Dallas County Bank Building, Dallas, Texas.

West Virginia Hardware Association Convention and Exhibition, Huntington, West Virginia, January 30 and 31, and February 1, 1923. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Indiana Retail Hardware Association Convention and Exhibition, Indianapolis, Indiana, January 30 and February 1 and 2, 1923. G. F. Sheely, Secretary, Argos, Indiana.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 6, 7, 8, 9, 1923. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Wisconsin Retail Hardware Association, Milwaukee Auditorium, Milwaukee,

Wiscousin, February 7, 8 and 9, 1923. P. J. Jacobs, Secretary-Treasurer, Stevens Point, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14, 15 and 16, 1923. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Cleveland, Ohio, February 13, 14, 15 and 16, 1923. Exhibition in the new Municipal Hall, James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Illinois Retail Hardware Association Convention and Exhibition, Hotel Sherman, Chicago, Illinois, February 13, 14 and 15, 1923. L. D. Nish, Secretary-Treasurer, Elgin, Illinois.

Iowa Retail Hardware Association Convention and Exhibition, Des Moines, Iowa, February 13, 14, 15 and 16, 1923. A. R. Sale, Secretary, Mason City, Iowa.

New York State Retail Hardware Association Convention and Exposition, Rochester, New York, February 20, 21, 22 and 23, 1923. Headquarters, Powers Hotel. Sessions and Exposition at Exposition Park. John B. Foley, Secretary, City Bank Building, Syracuse, New York.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 21, 22 and 23, 1923. George A. Fiel, Secretary, 10 High Street, Boston, Massachusetts.

Retail Hardware Doings

Florida.

The Peoples Hardware Store has started in business at Lake Worth.

Illinois.

The hardware store of D. D. Pilcher at Brownstown has been sold to Sam Wead.

John L. Costley has purchased a half interest in the hardware firm of John Killough Hardware Company of Clinton. The firm will continue business under the same name.

W. M. Haily, manager of the Davis Hardware Company, Barry, has sold his stock in the concern to F. A. Clark.

Roy Cantrell has purchased the Karr Hardware store at Noble.

Herman T. Ehrhardt, 307 South Eighth Street, Quincy, has purchased an interest in the Strott Hardware store, 1139 Broadway.

Indiana.

L. E. Danuser has opened a hardware store at 2528 South Calhoun Street, Fort Wayne.

Kentucky.

The hardware store of F. H. Henderson, Oakland, has been destroyed by fire.

The capital stock of the Collins Hardware Company, Frankfort, has been decreased from \$25,000 to \$12,500.

Minnesota.

At Deer Creek, the new hardware store of Piilola, Kela, Mattson and Company, has been opened for business.

Ohio.

W. E. McMillen has purchased the Horch Brothers' hardware store at Hilliards.

Study and Interpretation of Advertisements.

You Can Make Your Advertisements More Gainful by Avoiding the Faults and Profiting by the Good Qualities of Others.

As an example of terse but comprehensive description of an article in a selling message, praise is due to the advertisement of N. R. Groff



Improved Sickle Grinder

Will grind old Sickles to original shape three times as quick as a grind stone. Will not draw the temper. Can be adjusted to grind axes, discs, or any other edged tool. Price to introduce only \$6.75.

N. R. Groff Hdw. Co.

Hardware Company, reproduced herewith from the *Decorah Journal*, Decorah, Iowa.

The improved sickle grinder is shown in the illustration and then in a few clean-cut words, the story of what it will do is told.

If a whole page of text had been used, it would not be as effective and as easy to consider and remember as the simple statements of this advertisement.

The prospective customer is told that the improved sickle grinder will grind old sickles to original shape three times as quick as a grindstone.

Then he is informed that it will not draw the temper and that it can be adjusted to grind axes, discs, or any other edged tool.

These very desirable qualities make the price, stated in the advertisement, seem very reasonable, indeed.

* * *

When the mercury in the thermometer is lingering down around the zero mark, only people of the most vivid imaginations devote any thought to the matter of buying water coolers.

Most of us wait till warm weather comes and the need for such

commodities grows pressing before we think of making purchases.

Hence, it is most profitable to advertise water coolers and freezers in summer time, as the Hubbard Hardware Company does in the advertisement reproduced herewith from the *Columbus Ledger*, Columbus, Georgia.

This advertisement has a neat arrangement of the articles advertised and has two very good illustrations which help out the text.

It will be noted that there is an association of ideas between all the



SPECIALS
For All Next Week
Frost King Steel Frame **FREEZERS**

3-qt. \$2.90	6-qt. 4.55
4-qt. 3.60	8-qt. 5.85
10-qt. 7.85	

WATER COOLERS
Heavy Galvanized Iron with detachable faucets

3-gal. \$3.00	6-gal. 4.75
4-gal. 3.75	8-gal. 5.75
10-gal. 6.85	

Baseball Uniforms at greatly reduced prices all next week
Garden Hose 5-ply guaranteed rubber hose—25-ft. section . \$3.15
5-ft. section . \$6.00

HUBBARD Hardware Co.
Wholesale and Retail
12th and Broad



things mentioned in the advertisement—water coolers, ice cream freezers, baseball uniforms, and rubber hose—as all these things are related to one another.

* * *

Always it is an advantage to know where certain articles can be purchased.

The advertisement of Rogers City Hardware, reprinted herewith from the *Advance*, Rogers City, Michigan, not only tells the reader where building hardware and tools for mechanics can be purchased, but advises him that building materials of all kinds can be bought at the Rogers City Hardware Store.

But this is as far as the advertisement goes.

It does not mention any particular tools or building materials, nor give any intimation of prices.



Building Material

When You Build, remember that in addition to our large stock of Heavy and Shell Hardware we carry

Building Material of All Kinds And Special Building Hardware Tools for the Mechanic

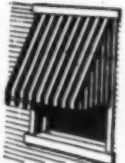
Rogers City Hardware
F. H. FLEMING
THIRD STREET ROGERS, MICH.

It is, in effect, a general announcement rather than a specific selling message.

* * *

The advertisement of the Fremont Hardware Company, reproduced herewith from the *Fremont News*, Fremont, Ohio, is well illustrated and, though brief, worded in such a way as to promote sales.

There is good profit in selling and erecting awnings.



Get a full season's use of Your Awning.
Order it now
Pay When it is put up.
Phone Main 2343

The Fremont Hdw. Co.

Awning supplies come naturally within the scope of the hardware trade, and there is no reason why the hardware dealer should not get some of this business.

Selling and erecting awnings also help increase the scope of the service of the hardware store.

* * *

The man who pays his debts usually has more money than the man who does not.

Facts of Warm Air Heating and Ventilating.

Reports of Progress in Warm Air Heater Research Work.
Ventilating Factories, Theatres and Other Buildings.

New Heating and Ventilating Reference Book Is Published.

The *Guide* of the American Society of Heating and Ventilating Engineers for 1922 has just been published. This volume containing accurate reference data for the design and construction of heating and ventilating installations, will be found particularly useful by architects, engineers, and contractors. The information is compiled from the Society's transactions, the investigations of its Research Laboratory, and the practice of its members, together with a Catalog Data Section, giving essential and reliable facts on manufacturers' equipment.

The first section of 100 pages gives the standards adopted by the Society, committee reports and technical papers, on a variety of heating and ventilating subjects.

The second or General Data Section of 100 pages, covers heat losses from buildings; transmission constants for building materials; data on boilers, radiators, chimneys; pipe sizes for steam heating; pipe sizes for gravity hot water heating; friction of water in iron pipes and elbows; expansion, steam and typical radiator connections; dimensions and capacities steam vacuum pumps; properties of air; psychrometric charts and tables.

The third and fourth sections give modern engineering and equipment practice and a directory of consulting engineers. The concluding or Catalog Data Section illustrates and describes the various equipment manufactured for heating and ventilating work. The headings under which this material may be classified are: air conditioning, drying, electrical equipment, dust collecting, fans, heating boilers, special heaters, humidifiers, insulating materials, pipe fittings, pumps, radiators, registers, regulators for

dampers, humidity, pressure, temperature, and water; separators, heating specialties, stokers, strainers, thermostats, traps and valves for air, back pressure, diaphragm, hot water, modulating, radiator, reducing, safety, thermostatic, vacuum; ventilators, water heaters and water treating apparatus.

The volume contains 360 pages, is adequately illustrated, and every department is cross-indexed. It is of convenient size, 6x9 inches, bound in cloth and may be obtained from the American Society of Heating and Ventilating Engineers, 29 West 39th Street, New York City, for \$3.00 per copy.

Predicts General Adoption of Circulators as Necessary Elements of Warm Air Heater.

At Low Temperatures the Circulator Produces More Velocity Than Can Be Produced by Gravity under Similar Conditions.

By F. R. Still, of American Blower Company, Detroit, Michigan.

(Continued from July 8th Issue.)

When the occupant of a house finds it impossible to heat his place, he does a little experimenting on his own account. Then he calls in the furnace man who does some more, usually without producing any marked effect on the job. Then somebody suggests that "The only way to make this job work is to put in a blower." Usually that is the wrong way to go about it.

Installing a blower for no other purpose than to overcome a defect by force, is an extravagance. Rightly applied, a blower will effect economies that can not be duplicated in any other way, and they are not recommended for any other purpose.

Applying a blower to a furnace, should be for no other purpose than to remove the film of air in immediate contact with the heating surface more rapidly than it can be moved by gravity.

As the film of air becomes heated, it carries away heat from the heating surface as it moves forward, and the more rapidly it moves, the heat is removed more rapidly because of a continuous film of cool air coming in contact with the hot surfaces.

The capacity of a furnace which is operating under the most favorable conditions, can be increased from two to three times by using a blower. At Urbana this was demonstrated after alterations were made which had already increased the capacity by gravity circulation 1.8 times.

With a limited height of chimney and a reasonable limit to the flue gas temperature, then the draft is fixed within rather narrow limits. The amount of draft fixes the rate of combustion, and the rate of combustion fixes the amount of heat obtainable from the fuel per unit of grate area.

Therefore, with a fixed ratio of heating surface to grate surface, when the maximum heat transmission from a given amount of heating surface has been reached by gravity circulation, the only way to get more heat is to increase the air movement over the surface, by a blower device of some kind, or install a larger furnace with larger flues, etc.

The available pressure head is so slight in gravity work, that it needs but little resistance to stop the flow and sometimes completely reverse it. It does not require much addi-

tional pressure in many cases to set the air in motion and as soon as the ducts and flues become thoroughly heated, they will continue to operate satisfactorily.

Wherever long horizontal or crooked ducts prevail, a blower must be installed which is large enough to handle all the air that will be required to convey the maximum amount of heat into the building.

Unless one is prepared to have such a blower operate continuously when heat is required, he may be disappointed in the results, as it becomes rather costly to pay for electric current as well as coal for continuous operation.

The reason why such a blower must operate continuously and not occasionally, as a circulator can be operated, is this: Some of the leaders offer very little resistance to the flow of air, whereas some of the others offer a great deal. Therefore, dampers must be inserted in those of the leaders which offer but little resistance, so as to make them equal the resistance of the others.

If this is not done, the bulk of the air will blow through the leaders having the least resistance, with the result that little would be gained in the delivery of more air or more heat to those rooms requiring more.

By making such adjustments of the dampers to equalize the flow, it introduces so much resistance to the whole plant that the furnace is unable to heat any part of it by gravity circulation alone. That is why the blower has to run all the time, when one is installed with the expectation that all of the air required by the building will have to pass through it.

All kinds of devices have been developed to stimulate the flow of air from furnaces without having to handle all the air required properly to heat a building. Many of such devices have long since passed out of existence, and have been forgotten. During the past two years, a new crop has sprung up, one of which was recently tested at the University of Illinois and reported to the last meeting of the Warm

Air Heating & Ventilating Association.

This particular device is intended to make it possible to heat a building by circulating air at low temperature instead of at high temperature, this avoiding hard firing with its inevitable waste, repairs and renewals to the furnace. Higher efficiency can be obtained under all weather and operating conditions and less attention will be demanded by the furnace to get satisfactory results.

Tests made on this device show that at a register temperature of 120 degrees it is possible to induce 60 per cent more air to flow than by gravity and at the same time get an overall efficiency 20 per cent higher. As the register temperature rises, the gain becomes gradually less; thus, at 180 degrees, the amount of air induced to flow over and above what would flow by gravity is 35 per cent more and the overall efficiency is but 3 per cent more.

Please bear in mind that this gain was effected after alterations had been made in the furnace so as to get the best possible results by gravity circulation.

This circulator was designed to induce the flow of several times the volume of air that the blower of itself will handle. It, therefore, consumes so little current that the cost of the fuel and the electricity combined, even if the circulator is run continuously, amounts to less than the fuel alone would amount to when similar results are produced, if such a thing could be effected.

It offers no obstruction to the flow of air in the recirculating pipe, so that the furnace can be operated without the blower running just the same as though nothing was there, and the results will in no way be different. When more heat is wanted, the circulator can be started, and without opening the drafts, the same volume of heated air can be obtained as can be obtained by gravity at temperatures 60 to 80 degrees higher. If the same velocity could be produced by gravity that the circulator produces at low tempera-

tures, then it would not be required.

The only other way to accomplish corresponding results, would be to make the leaders large enough to convey the required volume at the low temperature. In most cases this would be impracticable for lack of space, and besides, the efficiency of a furnace falls off so rapidly under such conditions that nothing like the same economy could be attained as with the circulator.

It is to be hoped that everybody will familiarize himself with the new code and will use it; that there will be more interest taken in the work being done at the University of Illinois and the Research Laboratory of the American Society of Heating and Ventilating Engineers at Pittsburgh, and better use made of the valuable data collected at both of these places.

Better furnaces are needed which are designed to work as convectors instead of radiators as they are now built. The fire boxes must be improved and the heat generated should be better conserved. A furnace should show 80 per cent to 90 per cent efficiency instead of 60 per cent which is the present maximum.

Not much improvement can be made without facts showing what has been done and wherein lie the faults. The two institutions above referred to which are carrying on research work are doing marvelous things for you, if you only know it, and as they continue with their work they will do still more marvelous things, toward stabilizing the business, than either of them have been able to do in the short time they have been devoting to this particular field.

This is an age of standardization. It is the only road to economical production. It is as necessary in the furnace and sheet iron business as in the machinery, boots and shoes or the dry goods business. Standards can not be determined except by getting down to the underlying basic facts and to get them requires careful research and experimentation, which takes time and costs a lot of money.

As you will all derive more or less direct benefit from any work of that kind, you should give it your moral and financial support and make use of the results as they are brought forth.

Some day circulators will be considered as necessary as any other part of a furnace plant. They will not be looked upon as something to fall back upon to make a defective plant acceptable, but they will be considered as an economical necessity, by means of which air can be circulated at more healthful temperatures, regardless of weather conditions.

Wilson Criticizes Harms' Installation Plan.

On page 23 of our July first issue George Harms of F. Meyer & Brother Company, Peoria, Illinois, described a plan for the installation of a warm air furnace at the re-

has the registers in the various rooms well located for convenience and heating ability. He has, however, overlooked one thing in locating his furnace.

Out of a total of 495 square inches of warm air taken from the furnace, Mr. Harms has so located the furnace that 382 square inches, or practically three-fourths of the air, is drawn from approximately one-third of the circumference of the bonnet. With the air taken so much from one side of the furnace there would be considerable heat loss in the basement. If the furnace could have been located slightly toward the front of the house, the warm air pipes could have been better distributed over the circumference of the bonnet with a more even distribution of the warm air.

In supplying the heater with the return cold air, he shows one 26 inch cold air pipe and locates the cold air face at one side of the

circulation is facilitated and the heat distributed through the house more evenly.

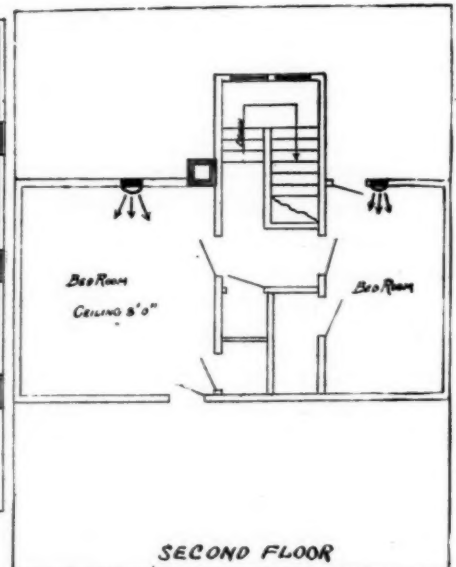
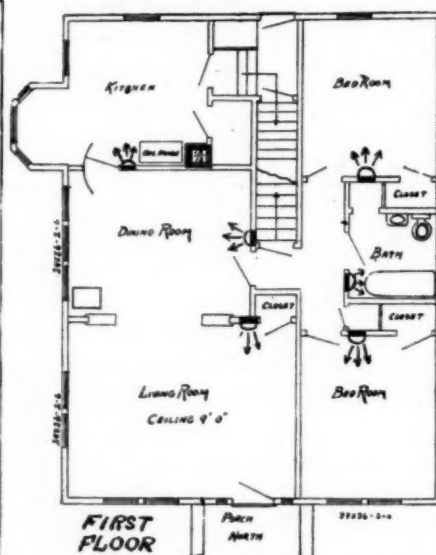
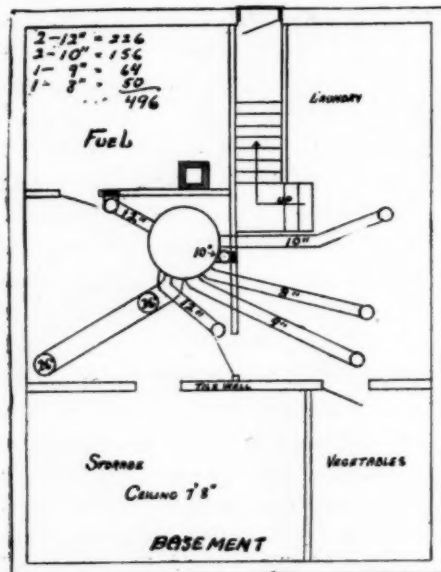
Warm air heating contractors do not as a general thing give sufficient attention to these details. Especially is this true with regard to the cold air. The use of two or more pipes with registers carefully located and, most important, supplying the heater with sufficient cold air will greatly increase the efficiency of the furnace and add to the comfort of those living in the house.

J. B. WILSON.

Newark, Ohio, July 12, 1922.

Gets Patent for Warm Air Furnace.

Under number 15,372, Dewitt A. Brunett, Minneapolis, Minnesota, has procured United States patent rights for a furnace described as follows:



Installation Plan for Warm Air Furnace for Which Changes Are Suggested by J. B. Wilson, Newark, Ohio.

quest of "Old Subscriber from Minnesota."

J. B. Wilson, sales manager of the May-Fieberger Furnace Company, Newark, Ohio, suggests in the following a number of changes in this plan, which in his opinion will make the furnace operate to better advantage:

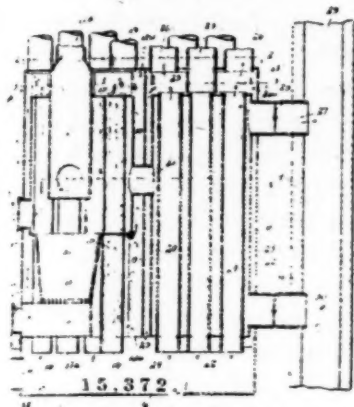
TO AMERICAN ARTISAN:

In the heating plan for "Old Subscriber of Minnesota" which Mr. George Harms has submitted, he

house. The cold air from the entire house is required to travel on the floor to this particular point, resulting in a floor-draft. If the cold air were divided and at least two return pipes used, the registers located at nearly opposite points in the house, the draft on the floor would be reduced to a minimum, and the cold air could be brought into the furnace at opposite sides. In distributing the return air both in the house and into the furnace,

In a hot air furnace, the combination with an outer primary casing and a secondary outer casing, said two casings have a common base air chamber, of primary and secondary drums respectively within said primary and secondary casings spaced therefrom at the sides, top and bottom, and affording, respectively, primary and secondary combustion chambers, the said two combustion chambers being connected for the passage of hot gases from

the former to the latter, primary and secondary air pockets formed, respectively, over the tops of said



primary and secondary combustion chambers, primary and secondary

hot air tubes extending, respectively, through said primary and secondary combustion chambers and connecting with the air chamber in the base and with the air pockets, and primary and secondary hot air pipes extending, respectively, from said primary and secondary air pockets.

American Chain Company Makes Three Styles of Furnace Chains.

The American Chain Company, Bridgeport, Connecticut, has long been known as one of the most prominent manufacturers of chains for practically all purposes.

Manufacturers and installers of

warm air furnaces will be interested in position to deliver from stock three types of furnace chains, viz., their "Acco" flat chain, a flat link made in bright or nickel plated finish, packed in 36-foot cartons and in knowing that this company



Acco Furnace Chain.

or on 500 foot reels. Their "Double Jack number 19" and their "Register" number 18.

Offices are maintained in Chicago, Pittsburgh, Philadelphia, New York, Boston, San Francisco and Portland, Oregon.

Tells How to Burn Soft Coal in Such a Way as to Get Biggest Amount of Heat Units without Wasteful Smoke.

Soft Coal Is Rich in Burnable Gas, the Same Gas Made for Gas Stoves, and it Can Be Burned to Full Effect in Warm Air Heater.

Written especially for AMERICAN ARTISAN AND HARDWARE RECORD by James S. Stevens, Sales Manager, Pennsylvania Coal and Coke Corporation, Boston, Massachusetts.

SECOND ARTICLE.

OUT of a hundred furnace makers, only two stated any portion of their product was unsuitable for burning soft coal. The other makers had thousands, and in some cases over 100,000 furnaces in use, burning soft coal every day in cold weather, and giving satisfaction.

In asking how to fire coal to get smokeless combustion, we hear many different views. Of course, with furnaces specially adapted for soft coal, no instruction may be needed. But for those who desire to know, these two methods may be helpful:

Soft coal is rich in burnable gas, the same gas made for gas stoves. If burned, this gas gives much heat, and no smoke. If unburned, it passes out in smoke and waste. The trick is to burn and not waste it.

Coal to be fired first on right side of furnace, leaving hot fire on left side to consume the volatile matter as it rises; then when coal on

right side is at red heat, firing fresh coal on left side. Repeat this method as needed.

A more careful and efficient method is as follows:

Always leave some ash on the grate. In mild weather a great deal, and in the winter two inches.

In building a new fire, put a lot of fresh, semi-bituminous coal in the back of the firepot, leaving one-third the grate free. This open space fill with paper, and kindling and light, having the draft on at the ash pit, the check draft closed, and smoke pipe damper open wide.

Since coal gives out its gas at a lower temperature than it cokes, it can not be fully afire till after it cokes. Do not try to set the whole mass of coal on fire at once. It wastes coal, and is unnecessary.

As the kindling burns, it starts the coal along the front face of the fresh pile. The coal first gives up its gas, which is burned; then it cokes and takes fire, and while it is coking, the top surface of the pile

begins to give off gas, and that burns. As the process continues, fire eats into the whole pile gradually. Leave it a while.

After some time the coal is all on fire, and the kindlings consumed. With the poker now draw the red-hot fire to the front part of the firepot, and fill up the back with fresh coal, the same as before.

By leaving on some draft at the ash pit, blue flame will start at the junction point between the fresh coal and the fire. If these flames do not start promptly, throw in a newspaper which will start them. If not, make more draft at the ash pit.

It is not necessary that fire should be under the fresh coal, preferably very little fire, or only ash.

When the blue flames start at the junction point, open the draft at fire door half or less, shut off draft at ash pit, and leave the fire. When fire becomes normal, adjust the check draft.

The same gradual combustion takes place, and the fire can be left

for four, eight, or more hours, according to size of firepot, thickness of coal and draft.

Replenish fire in the same manner, hot fire in front, fresh coal back.

In banking fire for the night, repeat the process, but when the blue flames are burning over the fresh coal, put more coal on the hot fire in front, close the ashpit draft, admit air through the fire door slots, and open the check draft, but leave the damper in the smoke pipe open, and leave it for the night.

The smoke pipe damper is closed only when all gas is burned off, except with large furnaces and chimneys.

This is one way to run a fire smokelessly, and get sufficient coal in the furnace to require little attention.

The system will work in any kind of firepot, whether square, round, oblong, shallow or deep, whether for a warm air furnace, a hot water boiler, or a steam boiler. If any one knows a better way, will he describe it?

It is fine to see how many manufacturers are putting out product which will save money on heating cost. In the East, where freight rates on anthracite and semi-bituminous are the same, and coals of finest quality to be had, there is a big opportunity to sell good furnaces.

The common practice of the mid-west, far west, and south, is unknown east, although here and there an individual has worked out the question. Practical information has been lacking, yet we have the choice and pick of the finest coals in the world, running up to 15,000 British Thermal Units per pound, selling at the mines for less than half the price of domestic anthracite.

In short, if it takes to heat a ten-room house, 10 tons of anthracite at \$15.00 per ton, or\$150.00
It would take less than 10 tons semi-bituminous, containing 10 per cent to 20 per cent more heat, costing less than \$10.00 per ton, or under 100.00

Saving at least\$ 50.00
The extra economy, due to greater heat in the coal, should save an additional 15.00

A total of 43 per cent, or\$ 65.00

As a matter of fact, semi-bituminous sells under \$9.00, instead of \$10.00 a ton.

There is a great need for more intelligent understanding of house heating in the east, and we are keen to see this come about, and are doing what we can; the question is how to get the information out.

Disseminating information and building up knowledge of what to burn and what to burn it in, is an attractive opportunity for furnace makers.

It will be idle to expect retail coal dealers to do this, for obvious reasons. But furnace manufacturers can and should show their public how to purchase and best use what they have to sell, and convince them that they as furnace makers are working for the buyers' advantage.

The technical work which furnace manufacturers are having done in the universities is admirable, but it has not yet gone far enough, because the maker has not always known what to ask for. For instance, to know the quantity of warm air a furnace will deliver, only partially tells the story.

It is equally important to know how much coal (or how many coal British Thermal Units) a furnace consumes to deliver standard load in cold weather. This tells whether the furnace is a good purchase.

To work this out, readings of flue gas can be taken, showing:

1. The oxygen, or O, in the flue gas. This reading enables the prevention of excess air by properly adjusting dampers, and thickness of fire. (Most wastes are due to too much air, or not enough).

2. The carbon monoxide, or CO, due to not enough air, which causes smoke and waste. It can be remedied in the same way.

3. Carbon dioxide, or CO₂, which shows when a fire is perfectly balanced. If the furnace delivers good CO₂, it prove the coal is efficiently burned. With a properly balanced fire, the minimum amount coal needed to give results can be known, and comparative furnace economy proven.

I have seen test charts showing average flue temperatures 250 degree higher than necessary, and warm air at 450 degrees. Such figures hurt a furnace, instead of selling it.

Our own thermometers on the same furnace showed average flue temperature of 350 degrees, which is low for a furnace getting red hot. The other test simply showed the furnace was forced unduly.

By cutting off draft, reducing thereby excess oxygen, and making no smoke or carbon monoxide; and getting moderate stack temperatures, we know that the furnace was not wasting, although it was heating top notch.

Technical information must be put before the public in form which can be understood, and which will lead the mind inevitably to see the advantage of buying the more efficient furnace and coal.

Here is a great opportunity for manufacturers to show the public the latest and best ideas, and to make sales where none were made before.

A man can afford to scrap an old furnace if a new one saves its cost in two or three years.

Of course, the furnace manufacturer, like all others, has constantly to decide whether he will make cheap goods or good goods. By showing the virtues of good furnaces, he proves that they are cheapest, after all. Too much cheap stuff is being sold for the good of the trade.

Of course, the furnace manufacturer, like all others, has almost daily to decide whether he will make cheap goods or good goods. Too many cheap furnaces are being made and sold. But by showing the virtue of good goods, the maker proves they are cheapest, after all.

There are so many good furnaces, it is idle to specify. We hailed the opportunity to make actual tests on two. In these instances eastern semi-bituminous coal was shipped to the makers, and when it arrived we made burning tests of the coal. One was a gas-proof furnace designed to con-

sume smoke and gas. This furnace burned first some very smoky western coal, which consumed without smoke. Afterwards, eastern coal was tried, also without smoke. One of them we are setting up in the writer's house.

On the other, we burned only eastern coal. The fire ran 26 hours with out visible smoke or vapor. This furnace was built on a somewhat new principle in house heaters and demonstrated complete efficiency.

After seeing at the Indianapolis Convention nearly a hundred types of heaters, it is a conservative statement to say that furnaces are being made and sold today which will burn soft coal on scientific lines,

can be bought at reasonable prices, and which give excellent and satisfactory service, making the householder independent of the high cost of anthracite.

In the manufacture of warm air heaters to burn soft coal, the western manufacturer is clearly in advance, and the more one looks into the matter, the more strongly is the opinion confirmed that a great opportunity now opens in the East.

I would not suggest, however, that all ingenuity in the heater line is in the west, for excellent products are made in the east. But it would seem as a whole the furnace trade is not alert to the possibilities of the eastern situation, as they should be. It looks like a glorious opportunity.

sighted policy of skimping on the very equipment that is most vital of all in providing home comfort.

"What could be more natural than for a builder to feel care-free about the furnace when he knows the responsibility can not definitely be placed on any one? He realizes that his competitors have also been putting cheap, under-sized furnaces in their homes for years, and that they have seemingly 'gotten away with it.'

"The purchaser of a house is told that it is 'completely equipped—ready to move into,' and he moves in. The contractor is pleased with his commission from the furnace manufacturer or dealer, plus the profit on the furnace sale. All goes well until winter comes. Then nothing goes well, and the homeowner takes the loss."

This is common sense argument—and common sense which appeals to the pocket book as well as to the prospective home owner's want of comfort.

What the installer of warm air furnaces can—and what he ought to do—is to make use of his local newspapers, as well as of personal letters, to bring out the fact that, no matter how much less an installation may cost, that installation costs too much if the furnace does not heat the house without being forced.

Incidentally it is worthy of note that during 1921 in Elgin, Illinois, a city of 30,000 people, the Holland representative took out an even one hundred furnaces which had been improperly installed and replaced them with Holland furnaces. Let the Elgin furnace installers count up the total number of installments made by them in the same period and compare it with that one hundred.

The Holland representative sold that one hundred installations by real effort. He did not wait until somebody came to him and said that he wanted to buy a furnace. He advertised Holland furnaces. He found out by an active canvassing just who might be in the market—and went after them.

Plugging the Game of the Contract Builder Who Puts in Poor Furnaces.

Take a Lesson from the Experience of the Holland Furnace Company.

FOR years the contract builder who puts up houses for sale has been one of the worst enemies of the conscientious installer of warm air furnaces and, by the same token, he has also been one of the worst enemies to the entire warm air furnace industry.

There are, of course, builders who listen to their consciences and who endeavor to construct dwelling houses according to proper principles of honesty, using good materials and installing appliances and apparatus of the proper quality and size in the proper manner, and we have no quarrel with them.

But in altogether too many cases it is an established fact that when it comes to warm air furnaces these contractors do not seem to care whether the furnace which they have installed is either too small or is not installed in accordance with acknowledged and generally accepted rules.

The natural result is that the furnace either fails to circulate enough heated air or wears out too quickly. In both cases, the warm air furnace receives a black eye.

The Holland Furnace Company, which sells and installs warm air furnaces through its specially appointed agents in nearly 250 cities felt that its business was affected in a detrimental way by this condition and started a campaign of advertising to change the condition—the underlying cause—and according to C. D. Karr, advertising manager of the Company, has proved to its own satisfaction that its method of advertising does bring about a change for the better.

The following is quoted from one of its advertisements:

"The contractor and professional builder are often tempted to buy cheap, under-sized, and otherwise inefficient furnaces for their clients. And so we urge every man to buy his own heating plant. Buy it direct from a responsible heating concern—one that issues a worth-while guaranty.

"The contractor's temptation results from several causes. First of all, the cost of building a home often exceeds the builder's estimate. And in an attempt to meet the difficulty he commonly employs the short-

Practical Helps and Patterns for the Tinsmith.

Aids to the Improvement of Craftsmanship and Business.
News from Various Branches of the Sheet Metal Trade.

DESIGNS AND PATTERNS FOR METAL TOMB.

By O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

In figure 17, we take up the peculiar design that is a little out of the ordinary, especially from a developing point of view, as a considerable amount of pattern drafting is necessary, in order to arrive at the correct shapes.

The elevation is first designed, working from the center line and establishing one outline.

By drawing horizontal lines from the bending points and dividing up a curve horizontal lines are projected and then by means of the dividers the half diameters are transferred over to the other side, which insures both halves being of the same shape.

To get the octagonal miter lines, a half plan is required and this is projected from the outlines at elevation as A-C-D; then from the various points as 1-2-3-4, etc., lines are erected and followed up from one miter line to the other.

From here as miter X-D they are dropped again to intersect elevation lines of a similar number. This will develop the octagonal miter as shown in elevation.

But for the lower molded chamfer, place in the corners of the panel body, these curved designs are sketched in on the one side at pleasure and they represent how the sides of the metal will be cut.

A true modified section must be developed through these chamfers in order to get at the true girth necessary to make the mold.

Otherwise, difficulty will be met with in making the chamfer patterns fit against the lines in the sides.

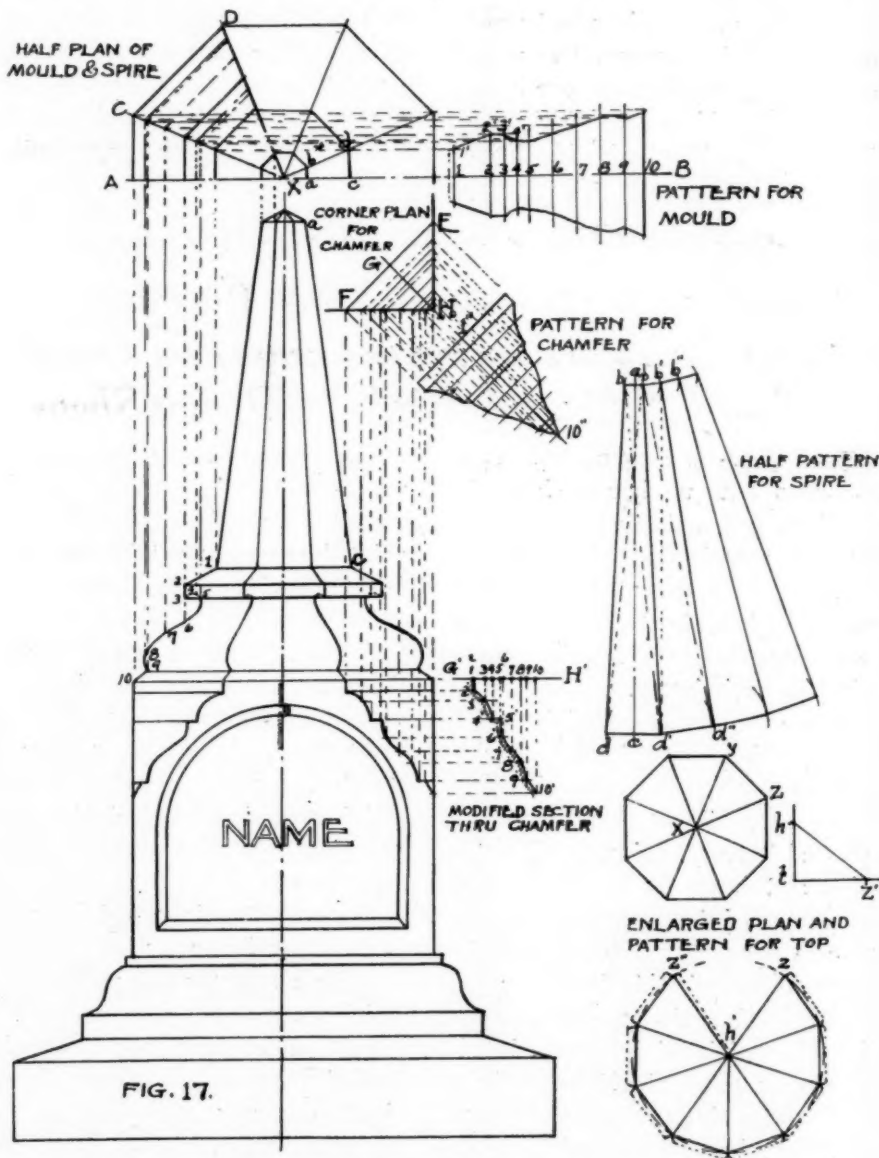
For this we draw the corner plan

for chamfer E-H-F of which E-F is the length of the octagonal line 10 in elevation.

At right angles to E-F draw a line as G-H and then from each point in the mold of elevation, erect lines to F-H and from here extend them parallel to F-E.

we set the various distances from G-H of corner plan; from here we drop lines and square over lines from the mold in elevation thereby establishing points 2'-3'-4', etc.

Sketch a line through the intersections thus established, and you have the true modified section



Designs and Patterns for Metal Tomb.

Where they cross the center line G-H we have the true width of mold in its projection, while the elevation will give us the true altitude of spaces between points.

So, at the right of elevation we draw a line as G-H and on this line

through chamfer which is also the stay used in forming the pattern for chamfer.

To set out the pattern, pick the girth from this modified section and set it off on a line 1"-10" and then project the pattern as shown.

To set out the pattern for the base mold of spire, pick the girth from 1 to 10 and set it off on a line A-B as 1-10 and then develop this miter from miter line X-C of half plan, which will give the miter cut as 1'-2'-3'-4', etc.

The same steps must be followed in developing the plan for spire as explained for a square one.

In this case a-c of elevation is the true length and we set this off on a center line as a-c.

We then add the half widths taken direct from elevation or from plan as a-b and c-d and set them in pattern as shown.

After the hip lines d-d and b-d' are drawn, this one side can be laid over by reversing the lines in a triangulation fashion to make b'-d", etc. In this way as much of the spire pattern can be gotten out as desired.

To set out the pattern for the top and large octagonal plan as shown near bottom of drawing, let h-t be the height the rise of cover is to be and then pick the miter line X-Z and set as t-Z'. Then the slant line h-Z' will be the radius for describing the arc in pattern.

Pick the side line as, for instance, Z-Y from plan and set off 8 of these spaces, drawing cord lines between these points and hip lines and that will give the pattern as shown.

Many of these problems are especially interesting to the pattern draftsman and where they may not be to the liking of some readers, it will be of interest to others in a geometrical constructive manner.

Small models when made for pattern drafting should be made up in order to see how your work turns out.

both on top and on the bottom sides.

The angles are fastened inside of the sheet iron frame about $\frac{3}{8}$ inches below the edges, so the sheet iron can be bent over the angle iron at the bottom side and away from the angle iron on the top side.

In other words, the angle iron frame inserted on the bottom side has a $\frac{3}{8}$ inch wide edge of the sheet iron turned over it, and upon the top side that edge is bent out, forming a lock for the steel plate to bend over and be lockseamed.

Stove bolts with round heads should be used for fastening the angle iron to the sheet iron frame. The steel plate that goes upon the top is 20 or 18 gauge and is locked over the edge of the sheet iron frame, and should not be double-seamed. Where the inverted sides come in from the front, two pieces of angle iron should be inserted, both on top and on bottom, to connect to the angle iron frames. Especially upon the top the connections are necessary to support the steel plate.

The openings in the sheet iron frame for the drawers are best formed by simply cutting the sheet iron where the drawer is to be, cross-wise, and bending the four right angles resulting, to the inside of the cabinet.

The drawers can be made long or short, to suit. The one to the left holds a wire-solder roll, mounted so the solder can be rolled off through an opening in the front of the

Zideck Describes Inexpense Dry-Test Outfit for Small Automobile Radiator Repair Shops.

Such Cabinets Can Be Purchased, But May Be Easily Constructed By the Sheet Metal Mechanic Himself If Deemed Advisable.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, New York City.

THIRTY-THIRD ARTICLE.

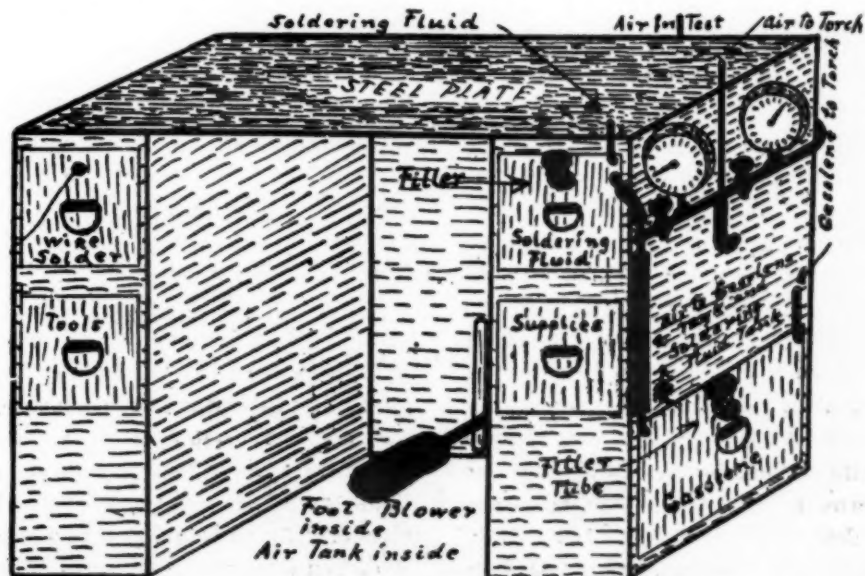
For the repairing of radiators on a small scale, and for doing the work in tin and sheet metal shops where the building of testing tanks appears impractical, the repair cabinet herewith illustrated and described, will be a convenient and welcome fixture.

The cabinet is of sheet metal and angle iron construction, and any mechanic can easily construct it himself. One sheet of 22 gauge steel 30x120 inches, formed into what resembles an "E" without the middle protrusion, will give the frame.

The size of the frame is 30 inches in the back, 20 inches for the sides, and 10 inches form the front inverted sides. The seam is in the corner formed by one of the inverted sides.

The angle iron used for the bottom and for the top is $\frac{3}{16} \times 1\frac{1}{4}$

inches, and is bent into right angles, the frame to fit into the sheet iron frame. The angles are formed with the corners cut out and the angle bent upon them, inside, so the outside part of the angle iron frame fits inside the sheet iron structure



drawer. The one to the right, holding soldering fluid, really is a tank, made of sheet lead, and only the front of the drawer is of sheet iron. The lead tank has two small diameter brass pipes coming out through the front, and connecting to the rubber tubing extending to the gasoline tank; the other coming up and forming a nipple to which the tubing from the fluid applicator is connected.

The other two drawers in the front hold tools, testing plugs and other small supplies, the repairer having everything he needs within the reach of his hands and reaching for it without stopping work.

The gasoline tank is made of tin plate. It can be round, with bottoms lockseamed, and the drawer plate just fastened to the round side of it. Two pieces of brass pipe come up from within it, one connecting to the air line and the other serving as a nipple for the blow-pipe rubber tubing.

Both the gasoline and the fluid tanks have protruding filler necks with screw caps, for convenient refilling.

The air tank is made of 24 gauge galvanized iron, round, well double seamed and soldered. The bottoms, one of which can be put on in the usual way and the other in the inverted way permitting of double seaming, should be slightly raised. The size of the tank is 10 inches in diam. by 20 inches high. It is fastened to the upper angle iron frame by bolts or rivets through the inverted bottom side of the tank, and the bolts or rivets are tightly soldered within the tank metal, the tank to be air-tight.

There is a 10 inch space below the tank for the foot blower to be installed, the blower frame fastened to pieces of angle iron which connect to the angle iron frame and hold to it by bolts. Rubber tubing is used to connect the foot blower with the air inlet in the tank. For the air outlet seamless brass or copper tubing, easily bent, might be used. This air connection reaches out through the side of the cabinet as shown in the picture, and con-

nects there to $\frac{3}{8}$ inch gas piping through which passes the air from the tank to the pressure indicator and regulator, also to the rubber tubing leading to the blow torch.

There are two, and possibly three, air valves or cocks, one regulating the air pressure indicated to the right and leading to the outlet in the back of the cabinet to connect to rubber tubing used for the introduction of air into the radiator being tested.

The other valve regulates the air pressure leading to the fluid and gasoline tanks. A third might be used to shut off the air leading to the torch. The pressure indicator to the left shows how much air there is in the tank.

The cabinet, fitted out as above described, is for the man who has not city gas at his service and is obliged to use gasoline. But the cabinet might be used even if there is city gas, in which case the gasoline tank is simply replaced by a gas pipe connection. The same applies to compressed air, getting it by other means than the foot blower. A pipe introducing it into the tank within the cabinet will be all that is wanted to make the cabinet ready for use.

This fixture is designed for dry-testing of radiators. For the wet test, there is another kind of fixture designed and it shall be described later.

Dry-testing cabinets of the above arrangement are being sold in various forms. There is one with cast iron frame and other divergent arrangements. But the above sheet metal and angle iron construction is presented here because the sheet metal worker or tinner, who is most likely to want a cabinet of this kind, can easily construct it himself.

All he needs to buy, ready-made, is the foot blower, the air pressure indicators, the gas pipe connections, the rubber tubing and the blow pipe.

If he has a set of good rubber plugs for stopping the openings in radiator; some small brushes and scrapers; a pair of copper-wire soldering irons; a set of small tools

such as screwdriver, snips, shears, pliers, steel points, etc., etc., and a soldering fluid applicator either with or without the brush, in addition, he has a complete and, considering its size and cost, a very efficient repair outfit with which he can do thousands of dollars' worth of work.

(To be continued.)

Milwaukee Sheet Metal Men Will Entertain Michigan Visitors.

At the monthly meeting of the Master Sheet Metal Contractors' Association of Milwaukee, Wisconsin, held July 6th, at the Builders' and Traders' Exchange, a committee consisting of President Edward Hoffmann, Secretary O. A. Hoffmann and E. H. Schneider was appointed to confer with the manufacturers and jobbers as to ways and means for entertaining the Michigan Sheet Metal and Roofing Contractors' Association which will spend Thursday, July 27th, in Milwaukee while on its annual outing, and to give the manufacturers and jobbers every assistance possible in making the visitors' stay in Milwaukee an enjoyable one.

John Bogenberger reported that the Employers' Council was contemplating the establishment of a co-operative employment bureau and by unanimous vote was instructed to work for such move by the Council.

The Secretary was instructed to notify National Headquarters that a certain company about which complaints had been made previously still persisted in quoting direct to architects and owners on slate, giving specific information about such recent quotations.

Knisely Is Re-elected Chief of Hollow Metal Door Body.

Harry C. Knisely, one of the prominent sheet metal contractors and manufacturers of hollow metal doors and windows in Chicago, was re-elected President of the Hollow Metal Door Contractors' Association at its recent meeting.

Somehow one's plain duty is usually too plain to be attractive.

Ferdinand Dieckmann Passes Away at the Age of 88 Years.

At the ripe old age of 88 years, Ferdinand Dieckmann, founder and president of the Ferdinand Dieckmann Company, manufacturers of sheet metal elbows, etc., passed away Monday afternoon, July tenth, at his residence near Cincinnati, Ohio, after a lingering illness.

Mr. Dieckmann was born June 4, 1834, in the city of Minden,

pered and many other lines were added.

After Mr. Dieckmann had passed his seventieth birthday he decided to give up the active management of the business, but the company which was organized with his name in 1905, retained him as president and he still occupied that office when he died.

He leaves three sons, Otto, who is vice-president of the company;

ing Trades Association of the same city. Much favorable comment has been given the plan, which has been evolved to date, and a detailed study of the same may prove valuable to the building trades and other industrial groups in other cities. After careful investigation the New York Building Trades interests decided that the only resource for providing men better trained for the building trades and in citizenship that is possible under present-day conditions lies in establishing a thorough and sound system of instruction based on apprenticeship principles. One of the great difficulties of the apprenticeship problem in the building trades is intermittent employment. The New York apprenticeship plan offers a definite assurance of continuous employment and the trade processes are taught on the job.



The Late Ferdinand Dieckmann.

Midvale-Republic-Inland Merger Likely to Go Through.

Representatives of the Midvale Steel & Ordnance Company, the Republic Iron & Steel Company and the Inland Steel Company have been invited to an informal conference with the federal trade commission in Washington, July 19th, to consider the proposed merger of the three companies. It is expected that the conference will go a long way toward deciding whether the commission will issue a complaint, as it has done in the Bethlehem-Lackawanna merger, or will not interpose any legal objections. A similar conference preceded the issuance of the Bethlehem-Lackawanna complaint. The questionnaires submitted in both mergers have been analyzed by the commission's experts and are being studied by the individual members of the commission.

The report of the department of justice on the proposed Bethlehem-Lackawanna and Midvale-Republic-Inland steel mergers probably will go to the senate late this week or early next, according to announcement by Attorney General Daugherty. Field investigators working on both mergers were ex-

Westphalia, Germany. At the age of sixteen years he came to the United States, settling in Cincinnati, where he has made his home ever since.

In 1854 he established himself in business at 82 Harrison Avenue, which is a part of the site upon which the present factories of the Ferdinand Dieckmann Company now stand. His first enterprise was the making of cast iron statues, and one of these, a twelve foot image of Saint Joseph, is still standing in the church of that name in Cincinnati.

It was in 1859 the sheet metal one piece elbow business was started and Mr. Dieckmann designed and made his own machine for manufacturing these very useful and economical articles. As time went on, the business pros-

Louis and Adolph, and one daughter, who is treasurer of the company.

The body was cremated Wednesday afternoon, July 12th, Mr. Dieckmann being one of the charter members of the Cincinnati Crematory Association.

Mr. Dieckmann was one of the typical foreign born Americans who in spite of his love for his "old country," was intensely patriotic and proud of his adopted country.

New York Building Trades Have Fine Apprentice System.

A comprehensive apprenticeship system designed and fostered by the New York Building Congress has had the unanimous endorsement of the New York Building Trades Council and the New York Build-

pected to complete their work July 13th. The attorney general said the department's invitation for objectors to file complaint against the proposed mergers brought no response.

Clayton & Lambert Organization Celebrate 35 Years in Business.

An informal get-together-and-boost-dinner was given by the management of the Clayton & Lambert Manufacturing Company to 125 members of their organization, including the office and factory heads of departments, on the evening of July 6th. The event was in celebration of their thirty-five years of business growth and in honor of several employees who had faithfully served the company for twenty years or more, to whom watches and other tokens of appreciation were presented by Otto J. Groehn, Factory Manager.

J. E. Lambert, President of the Company, acted as Toastmaster and in an address reviewed the early history of the Company, who are pioneers in making gasoline fire pots, torches and braziers, then located at Ypsilanti, Michigan, and later moving to Detroit, referred to the remarkable growth of the industry up to the limitations of their present new factory, which is the largest factory in the world for making these specialties.

Bert Lambert, Treasurer and General Manager, expressed the appreciation of the management to all present for their faithful help during the past strenuous months and in an optimistic talk regarding the present and future conditions requested each and all to continue to co-operate and boost.

C. A. Bower, who has been with the organization since 1901 and who is well known to the jobbing trade as "The Torch and Fire Pot Salesman," was presented with a watch in appreciation of the management and a Shrine pin from his many friends in the employ of the Company.

A number of ladies were present and the very enjoyable evening was closed with music and dancing.

It Is to Your Advantage to Prevent Fires.

As is generally known, fire insurance rates are based on the "probability" that the building insured will burn.

The "probability" is determined by what has happened in the past. In the past men have smoked in the buildings where there is much inflammable matter, such as hay or straw.

Children have secured matches with disastrous results.

Bonfires have been built too close to building.

Litter has been allowed to accumulate in or near buildings.

Chimneys have been allowed to become defective or filled with soot.

The buildings have not been protected by lightning rods, a storm came up, and only the ruins of a burned structure remained.

Recall the circumstances surrounding almost any fire you have vivid recollection of, and you will readily figure out that it might have been prevented.

But to prevent fires the danger of fire must be kept constantly in mind.

Soon this danger becomes ever present in the mind, and the things that cause fires are shunned automatically.

Don't Lock Up Your Money in Slow-Moving Goods.

Before buying goods for your store, study the needs of your community.

Do not invest your capital in commodities for which there is seldom any call.

It is much better to send out and buy the seldom called for article whenever you have a demand for it than to have your money tied up in it.

Notes and Queries

Vacuum Cistern Cleaner.

From Meier Brothers, Henry, Illinois.

Kindly advise us where we can buy a vacuum cistern cleaner.

Ans.—Bennett System Cistern Sanitation, 314 Schradzki Building, Peoria, Illinois.

Enameling Ovens.

From Tarr and Company, 157 North Third Street, Memphis, Tennessee.

Please inform us who makes small capacity enameling ovens.

Ans.—Detroit Heating and Lighting Company, Detroit, Michigan; Evans and Eichner, 29 West Lake Street, Chicago, Illinois; Oven Equipment and Manufacturing Company, New Haven, Connecticut.

Name Plates.

From Young Hardware Company, Bellevue, Iowa.

Will you kindly let me know who makes nickel plated name plates about 3½ by 7½ inches?

Ans.—The Turner Brass Works, Sycamore, Illinois; Crowe Name Plate and Engraving Company, 1749 Grace Street, Chicago, Illinois; General Etching and Manufacturing Company, 312-316 South Hamilton Avenue, Chicago, Illinois, and The C. H. Hanson Company, 178 North Clark Street, Chicago, Illinois.

"Patric" Furnace.

From Aurora Cornice Works, 5 North River Street, Aurora, Illinois.

Kindly advise us who makes the "Patric" furnace.

Ans.—Patric Furnace Company, Springfield, Ohio.

Retinning.

From Reynolds Furnace Company, Humboldt, Iowa.

Will you kindly inform us where we can get retinning done?

Ans.—C. Doering and Son, 1375 West Lake Street, and Thompson-Bremer and Company, 1750 Carroll Avenue, both of Chicago, Illinois.

2" Adjustable Galvanized Elbows.

From T. B. Callahan, The Akron Sheet Metal Company, 103 North Main Street, Akron, Ohio.

Please let me know where I can purchase 2 inch adjustable galvanized elbows.

Ans.—The W. J. Burton Company, Detroit, Michigan; Clark-Smith Hardware Company, Peoria, Illinois; Robertson Brothers Manufacturing Company, 5401 Western Avenue Boulevard, Chicago, Illinois.

Descriptive Index and Guide to New Patents.

Improved Devices Which May Save Labor in Your Shop
or Add Another Source of Income to Your Retail Store.

1,417,404. Oven. Peter Mustonen, Superior, Wis. Filed Nov. 20, 1920.

1,417,632. Fishing Reel. Samuel G. Russell, Kalamazoo, Mich., assignor to The Shakespeare Company, Kalamazoo, Mich. Filed April 21, 1921.

1,417,633. Fishline Reel. William Schmid, Bronson, Mich. Original application filed Sept. 5, 1919. Serial No. 321,910. Divided and this application filed Aug. 9, 1920.

1,417,711. Riveting Tool. Frank A. Becker and Albert P. Andlauer, Kansas City, Mo. Filed Dec. 27, 1920.

1,417,725. Tool Kit. George R. Fullenwider, Maple Valley, Wash., assignor of one-half to Olof Olson, Maple Valley, Wash. Filed Dec. 19, 1919.

1,417,726. Motor Driven Hand-saw. Charles M. Geiger, New

York, N. Y., assignor of one-half to Alfred L. Flynn, New York, N. Y. Filed June 23, 1920.

1,417,756. Wrench. Arthur McDonald, Vancouver, British Columbia, Canada. Filed Nov. 18, 1921.

1,417,760. Auger Bit. Elmer T. McPherson, Wallingford, Conn. Filed Jan. 7, 1921.

1,417,783. Automobile Radiator. Robert R. Swaney, Sacramento, Calif. Filed Dec. 26, 1919.

1,417,792. Adjustable Spanner Wrench. John J. Bartenstein, Cleveland, Ohio, assignor to The Fairmount Tool and Forging Company, a Corporation of Ohio. Filed Oct. 13, 1919.

1,417,818. Nail. William K. Frost, Hollywood, Calif. Filed June 7, 1921.

1,417,981. Chuck. Gustaf A. Englund, Hartford, Conn., assignor to The Jacobs Manufacturing Com-

pany, Hartford, Conn., a Corporation of Connecticut. Filed May 27, 1921.

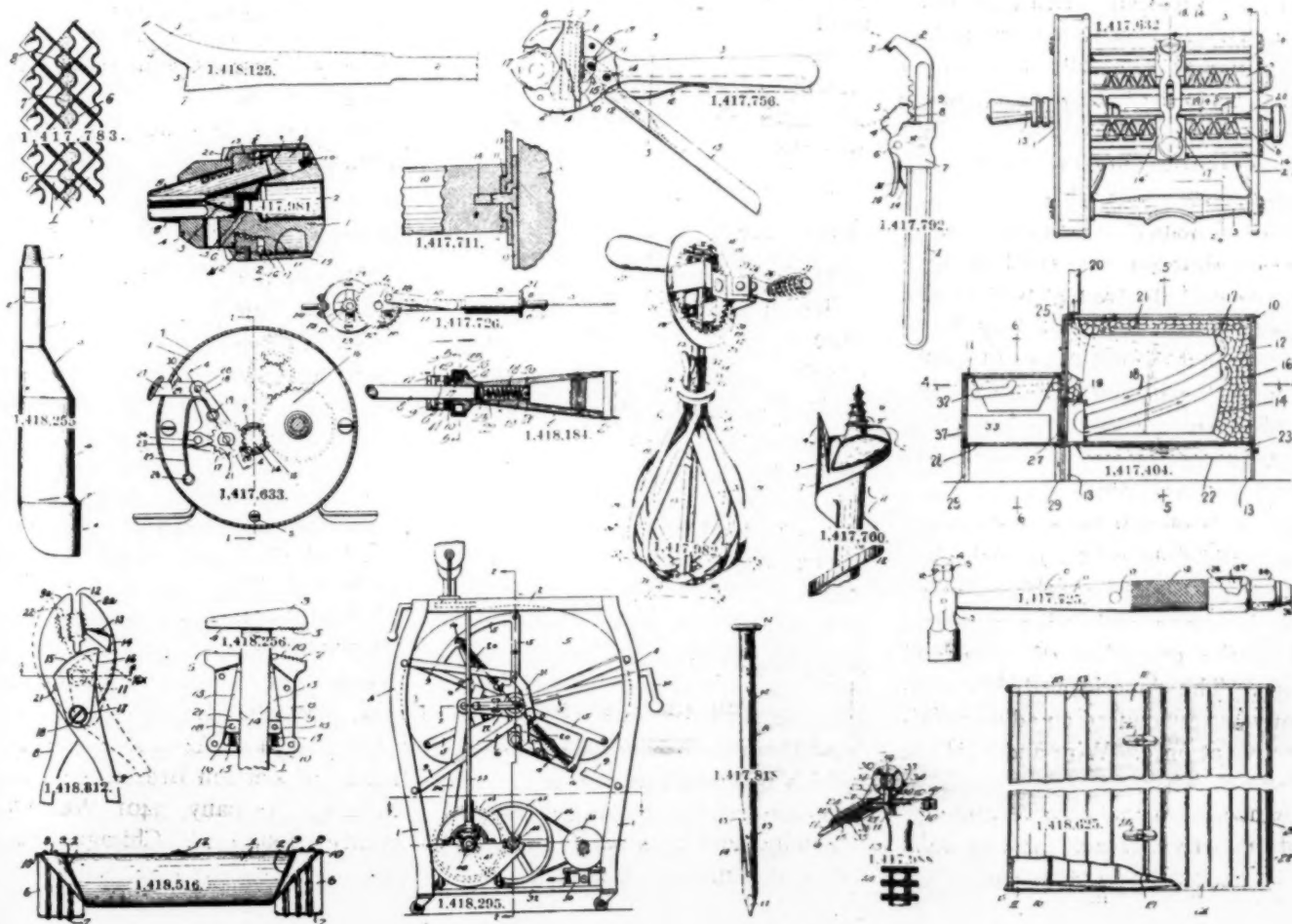
1,417,982. Beater. George J. Fitzpatrick, Chicago, Ill. Filed May 26, 1921.

1,417,988. Safety Razor. John S. Gullborg, Chicago, Ill., assignor, by mesne assignments, to The Rotary King Safety Razor Company, New York, N. Y., a Corporation of Delaware. Filed March 6, 1920.

1,418,125. Metal Working Tool. William P. Carrol, Horton, Kans. Filed August 26, 1921.

1,418,256. Wrench. Harry Gutman, Chicago, Ill. Filed July 22, 1921.

1,418,625. Washing Machine. Forrest J. Couch, Rochester, N. Y., assignor to Clark, Cadle, Harmon Corporation, Rochester, N. Y., a Corporation of New York. Filed Dec. 16, 1920.



Review of Conditions in the Metal Markets.

General Situation in the Steel Industry. Report of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

COPPER PRICE ADVANCES TO FOURTEEN CENTS.

The main feature of interest in the copper situation continues to be the active demand for export, sales having been made this week at 14 cents New York, and 14¼ cents European points. Some outside producers report that ⅛ cent higher has been paid for export, but this cannot be verified. The Copper Export Association has advanced its price to 14¼ cents Hamburg.

Covering of short contracts by domestic and foreign dealers is assigned as one cause for the sharp advance in prices for prompt and July shipment.

Since July 1st exports from New York have amounted to 1,479 tons. It is notable that orders are again coming from the Orient for casting as well as for electrolytic.

Buying on domestic account is mainly for prompt, August and September shipment. Producers have taken additional business at 14 cents delivered for these positions. It is doubtful that any electrolytic can now be obtained under 14 cents delivered although there were again reports this morning that some business had been transacted at 13⅞ cents delivered. Thus far there is small interest in the market for shipment beyond September so far as consumers are concerned.

The increased demand and stronger market for unwrought copper is reflected today in an advance of ½ cent a pound on finished copper and brass products with the exception of wire and rods. The American Brass Company has announced an advance, effective at once. Wire and rods are ⅛ cent higher.

In the outside market offerings are light. Only a few lots now remain in second hands and these are

firmly held at 13⅞ cents to 14 cents f. o. b. refinery for shipment over the next two months. In fact most of the resale lots are offered only for prompt shipment. Lake copper is also stronger but quiet at 14 cents to 14¼ cents delivered for July and August shipment. Casting copper is stronger at 13.35 cents refinery and 13.45 cents New York.

Chicago warehouses quote sheet copper at 20¾ cents, base.

Tin.

There is still a dull and uninteresting market in New York on pig tin, for while prices may be a little lower, the deadlock between buyers and sellers is unbroken. Offers to sell Straits tin for prompt or forward deliveries at 31⅞ cents have aroused no interest from consumers, and while dealers are willing to pay 31⅞ cents to 31¼ cents the small tonnages that they would take at these levels hardly makes it worth while for sellers to cut their prices.

99 per cent tin on the spot is quoted at 30⅝ cents but for delivery from steamers en route or for July-August shipment from China 30½ cents is quoted.

Banca is dull at around 31 cents to 31⅞ cents.

There are reports by way of London that the last half of the year will witness a falling off in the Straits production, but so often in the past similar reports have proved to be incorrect that the American trade does not take much stock in them.

Lead.

There is an easier market for prompt and July lead in the west, and 5½ cents, Saint Louis basis, can be shaded for these positions, and there are some outside lots on which bids are invited.

Producers report a fair amount of selling for August shipment, and some very good orders are be-

ing placed from time to time, though the total does not represent anything like the activity seen a month or two ago.

Chicago warehouse prices follow: Pig lead, 6 cents; bar lead, 6.75 cents; sheet lead, in full coils, \$9.00; in less than full coils, \$9.25.

Solder.

To those that are looking for lower prices on solder, the following statistics on Straits Tin—the prime factor—should be of interest:

Average price, 1911....	42.68 cents
Average price, 1912....	46.43 cents
Average price, 1914....	35.70 cents
Average price, 1918....	86.80 cents
Average price, 1921....	30.00 cents
Price today	31.25 cents
Average for ten years...	50.29 cents

Chicago warehouse prices on bar solder are as follows: Warranted 50-50, 22 cents; Commercial 45-55, 20½ cents; Plumbers' 40-60, 19¼ cents.

Zinc.

Sales of sheet zinc are increasing and a good number of inquiries are being received by manufacturers of roofing. The sale of sheets for washing machines and automobiles is somewhat quiet, but there is an improved demand for zinc shingles.

Cuba and Alaska each bought a carload of zinc roofing yesterday from the Illinois Zinc Company. Zinc roofing for factories and other commercial buildings has found considerable favor in Cuba. Larger inquiries also come from Central and South American countries.

The Illinois Zinc Company is establishing jobbers' agencies in New Jersey towns.

Another manufacturer of zinc roofing said, "We are receiving a large number of inquiries daily and more inquiries are being turned into actual orders for a month. We expect an excellent domestic business

this summer. We are figuring on several contracts which will require three or four carloads each and we have heard of one project that may require at least five carloads."

Chicago warehouse prices are as follows: \$6.25 in slabs, with sheet zinc in cask lots at 8½ cents and 9 cents in less than cask lots.

Sheets.

The steel ingot production report of the American Iron & Steel Institute and the unfilled tonnage report of the United States Steel Corporation for June, when analyzed together, give some very interesting information as to the relative positions of the leading interest and the independents during the third month of the coal strike. In June fuel shortage forced the independents to curtail production about one per cent, while the output of the steel corporation showed an increase amounting to almost 3½ per cent. Although the steel ingot production of the country fell short in June of the May output by 88,332 tons, this was due to there being one less working day in the latter month and had there been the same number of working days a gain in production would have been recorded as the rate of output for the entire industry was slightly below 68 per cent in May and slightly greater than this figure in June. The wide spread between the positions of the two "halves" of the industry is reflected in the average operating rates of the two in June, the mills of the corporation producing at approximately 77 per cent and those of the independents at 63 per cent of capacity. Labor and fuel shortages were the prime difficulties encountered by the industry in June and all schedules for expansion of production were cut down materially, but the independents were hardest hit in that their fuel supplies were curtailed much more drastically. June production by the leading interest was approximately 1,460,000 tons and that by the independents 1,550,000 tons. The leading interest produced about 7,435,000 tons of steel during the

first half of the year and showed a net gain in unfilled orders on its books of 1,367,217 tons, while the increment of increase in June amounted to 381,303 tons.

Record of the corporation's unfilled orders since May 31, 1920, follows:

June 30, 1922	5,635,631
May 31, 1922	5,254,228
April 30, 1922	5,096,917
March 31, 1922	4,494,148
February 28, 1922	4,141,069
January 31, 1922	4,241,678
December 31, 1921	4,268,414
November 30, 1921	4,250,542
October 31, 1921	4,286,820
September 30, 1921	4,560,670
August 31, 1921	4,531,926

July 30, 1921	4,830,324
June 30, 1921	5,117,868
May 31, 1921	5,482,487
April 30, 1921	5,845,224
March 31, 1921	6,284,765
February 28, 1921	6,933,867
January 31, 1921	7,573,164
December 31, 1920	8,148,122
November 30, 1920	9,021,481
October 31, 1920	9,836,852
September 30, 1920	10,374,804
August 31, 1920	10,805,038
July 30, 1920	11,118,468
June 30, 1920	10,978,817
May 31, 1920	10,940,466

Chicago warehouse prices on sheets are as follows: Galvanized, 5.45 cents; black, 4.45 cents; blue annealed, 3.38 cents.

Pig Iron Situation Shows No Important Changes During Week.

Review of Past Six Months Calls Attention to Great Improvement Since January.

It is interesting to compare the statements of sellers of pig iron made six months ago and at the close of the first six months of 1922. Here is a typical example, keeping in mind that while there was a good deal of talk about hopes for business in January, actual orders were not big, nor numerous:

"Here we are at the beginning of the second half of the year—and affairs in the iron trade now and as they were at the beginning of the year offer a most decided contrast. In the first week of January order books were bare—now they are well filled; prices were at the bottom—now they have had a substantial advance; losses gloomily stared everybody in the face—now there are profits in sight; then things seemed hopeless—now there is an optimistic and energetic spirit animating men to their best efforts. It is a complete right about face.

"Of course, we have not by any means made a complete recovery—but altogether the prospect, while leaving much to be desired, is still vastly more pleasing than was the case six months ago. And there

is no question but that the improvement in the iron trade is of the growing variety. All our reports from consuming centers are to the effect that everyone is a little more busy—things just continue coming right along.

"Inquiry and sales keep up nicely. This week there has been a good run of orders, but without any special features. An immense volume of iron is yet to be bought for melters' needs during the latter half. Sometime within the next sixty days we may expect a buying movement of major proportions. At present iron masters are fearful of commitments far in advance because of the uncertainty regarding coke. This is in exceedingly short supply. The plain truth of the matter is that it is more profitable for the coal miners to sell their coal as coal than to burn it into coke. It appears to us that in all the finished lines of iron products the revival has been greater than the increase in the production of raw materials. Coal, coke and iron are all in short supply and this fact becomes more and more apparent. Prices are firm with an upward tendency."

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

FIG IRON.

Chicago Foundry	\$24 00 to \$25 00
Southern Fdy. No. 2	24 00 to 26 00
Lake Sup. Charcoal	21 65
Malleable	24 00 to 25 00

FIRST QUALITY BRIGHT TIN PLATES.

	Per Box
IC 14x20 112 sheets	\$10 00
IX 14x20	11 25
IXX 14x20	12 60
IXXX 14x20	13 90
IXXXX 14x20	15 25
IC 20x28	20 00
IX 20x28	22 50
IXX 20x28	25 20
IXXX 20x28	27 80
IXXXX 20x28	30 50

COKE PLATES.

Cokes, 180 lbs...	20x28 \$11 80
Cokes, 200 lbs...	20x28 12 00
Cokes, 214 lbs...IC	20x28 12 35
Cokes, 270 lbs...IX	20x28 14 10

BLUE ANNEALED SHEETS.

Base.....	per 100 lbs. \$3 33
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ONE PASS COLD ROLLED BLACK.

No. 18-20.....	per 100 lbs. \$4 25
No. 22-24.....	per 100 lbs. 4 30
No. 26.....	per 100 lbs. 4 35
No. 27.....	per 100 lbs. 4 40
No. 28.....	per 100 lbs. 4 45
No. 29.....	per 100 lbs. 4 55

GALVANIZED.

No. 16.....	per 100 lbs. \$4 70
No. 18-20.....	per 100 lbs. 4 85
No. 22-24.....	per 100 lbs. 5 00
No. 26.....	per 100 lbs. 5 15
No. 27.....	per 100 lbs. 5 30
No. 28.....	per 100 lbs. 5 45
No. 30.....	per 100 lbs. 5 95

BAR SOLDER.

Warranted.	
50-50	per 100 lbs. \$22 00
Commercial.	
45-55	per 100 lbs. 20 50
Numbers	per 100 lbs. 19 25

ZINC.

In Slabs	6 25
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SHEET ZINC.

Cask lots, stock.....	3 1/2 c
Less than cask lots.....	9

COPPER.

Copper Sheets, base.....	20 1/2 c
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LEAD.

American Pig	6 00
Bar	6 75
Sheet.	
Full coils	per 100 lbs. 9 00
Cut coils	per 100 lbs. 9 25

TIN.

Pig tin.....	per lb. 34c
Bar tin.....	per lb. 36c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.	
Barton's	Net
White's	Net

AMMUNITION.

Shells, Loaded, Peters.	
Loaded with Black Powder 18%	
Loaded with Smokeless Powder	18%
Winchester.	
Smokeless Repeater	
Grade	20 & 4%
Smokeless Leader	
Grade	20 & 4%
Black Powder	20 & 4%
U. M. C.	
Nitro Club	20 & 4%
Arrow	20 & 4%
New Club	20 & 4%
Gun Wads—per 1000.	
Winchester 7-8 gauge 10&7 1/4%	
" 9-10 gauge 10&7 1/4%	
" 11-28 gauge 10&7 1/4%	

ASBESTOS.

Paper up to 1/16.....	6c per lb.
Rollboard	6 1/2 c per lb.
Millboard 3/32 to 1/4.....	6c per lb.
Corrugated Paper (250 sq. ft. to roll).....	\$6.00 per roll

AUGERS.

Boring Machine.....	40&10%
Carpenter's Nut	50%
Hollow.	
Bonney's.....	per doz. \$30 00
Post Hole.	
Iwan's Post Hole and Well	
"	30 and 5%
Vaughan's 4 to 9 in. with-	
out handles per doz.	\$14 00

AWLS.

Brad.	
No. 3 Handled.....	per doz. \$0 65
No. 1050 Handled	1 40
Patent asst'd, 1 to 4	35
Harness.	
Common	per doz. \$1 05
Patent	1 00
Peg.	
Shouldered	1 60
Patented	75
Scratch.	
No. 18, Socket	
Handled	per doz. \$2 50
No. 344 Goodell.	
Pratt, 11st less.....	35-40%
No. 7 Stanley.....	per doz. \$2 25

AXES.

First Quality, Single	
Bitted (unhandled), 3 to	
4 lb., per doz.....	\$10 50
Good Quality, Single	
Bitted, same weight, per	
doz.....	9 50

BALANCES, SPRING.

Universal.	
Sight Spring.....	List less 25%
Straight	List less 25%

BARB, WRECKING.

V. & B. No. 12.....	\$0 45
V. & B. No. 24.....	0 75
V. & B. No. 32.....	0 80
V. & B. No. 39.....	0 85
V. & B. No. 330.....	0 90

BEVEL, TEE.

Stanley's Rosewood handle, new	
list	Nets
Stanley iron handle.....	Nets

BINDING CLOTH.

Zinc	55%
Brass	40%
Brass, plated	60%

BITS.

Auger.	
Jennings Pattern.....	Net
Ford Car.....	25% off
Ford's Ship.....	25% off
Irwin	25%
Russell Jennings.....	less 10%
Clark's Expansive.....	33 1/2%
Center	10%

Countersink.

American Snallhead.....	1 75
" Rose	2 00
" Flat	1 40

Dowel.

Russel Jennings	plus 20%
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Gimlet.

Standard Double Cut Gross	\$8 40
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Nail Metal Single

Cut	Gross \$4 00—\$5 00
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Reamer.

Standard Square.....	Doz. \$2 50
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American Octagon..

"	2 50
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Screw Driver.

No. 1 Comomn.....	Each 18c
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No. 26 Stanley.....

"	Each 70c
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BLADES, SAW.

Wood.	
Atkins 30-in.	6 40 26
Noa	\$8 90 \$9 45 \$5 40
Diston 30-in.	6 66 26
Noa	\$9 45 \$10 05 \$9 45

Wooden

"	20%
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Patent

"	20%
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BLOW TORCHES (See Firepots).

BOARDS.

Stove.	
26x26, wood lined.....	Per. Doz. \$14 45
28x28, "	16 95
30x30, "	19 00
26x26, paper lined.....	8 15
28x28, "	9 10
30x30, "	10 80

Wash.

No. 760, Banner Globe	
(single).....	per doz. \$5 25
No. 652, Banner Globe	
(single).....	per doz. 675
No. 801, Brass King, per doz.	8 25
No. 860, Single—Plain	
Pump	6 25

BOLTS.

Carriage, Machine, etc.	
Carriage, cut thread, 1/4x6	
and sizes smaller and	
shorter	60%
Carriage sizes, larger and	
longer than 1/4x6.....	50 & 5%
Machine, 1/4x4 and sizes small-	
er and shorter.....	60 & 10%
Machine, sizes larger and	
longer than 1/4x4.....	50-10 & 5%
Stove	80%

Mortise, Door.

Gem, iron	5%
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Gem, bronze plated.....

"	5%
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Barrel.

Cast	Net
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Wrought

"	Net
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Wrought, bronzed

"	Net
---------	-----

Flush.

Wrought	Net
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Spring.

Wrought	"
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Wrought, heavy

"	"
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Square.

Wrought	"
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BOXES.

Mail, No. 2	4 10
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Per doz. \$18 00 \$23 00 \$29 00	
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Cast Iron.

Per doz.	\$9 50
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Mitre.

Stanley's.....	Net Prices
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Stearns, No. 2.....	per doz. \$43 00
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BRACES, RATCHET.

Goodell-Pratt No. 403.....	\$4 60
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" " No. 410.....	4 80
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" " No. 412.....	5 00
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V. & B. No. 444 3 in.....	4 65
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V. & B. No. 333 3 in.....	4 30
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V. & B. No. 222 3 in.....	4 00
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V. & B. No. 111 3 in.....	3 50
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V. & B. No. 11 3 in.....	3 05
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BURRS, RIVETING.

Copper Burrs only.....	50%
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Tinners' Iron Burrs only.....

"	Net
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BUTTS.

Steel, antique copper or dull	
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brass finish—case lots—	
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3 1/4x3 1/4.....	per dozen pairs \$2 75
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4x4.....	3 50
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Heavy Bevel steel inside	
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sets, case lots.....	per dozen sets 7 50
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Steel bit keyed front door	
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sets, each	1 80
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Wrought brass bit keyed	
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front door sets, each....	3 25
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Cylinder front door sets,	
---------------------------	--

each	7 00
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CALIPERS.

Double	Net
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Inside and Outside	"
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Wing	"
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CARRIERS.

Hay.	
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Diamond, Regular.....	each, nets
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Diamond, Sling.....	"
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CASTERS.

Standard—Ball Bearing.	
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Bed	50 & 10%
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Common Plate.....	40%
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Brass Wheel	15%
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Iron and porcelain wheels,	
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new list	50%
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Philadelphia Plate, new	
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list	50%
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Martin's	40%
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CATCHERS, GRASS.

No. 1608.....	per doz. \$12 25
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No. 1658.....	14 01
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CEMENT, FURNACE.

American Seal, 5 lb. cans, net	\$0 45
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" " 10 lb. cans, "	30
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" " 25 lb. cans, "	1 37
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Asbestos, 5 lb. cans.....	45
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Pecora, 5 lb. cans.....	45
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" 10 lb. cans.....	90
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" 25 lb. cans.....

CLEAVISES.		FACES, WOOD—50% off list.		Tinner's Riveting, No. 1, 8		Clothes Line.	
Malleable	10c lb.	FENCING.		oz., each	80	Japanned....per doz.	35c—1 00
CLIPPERS.		Lawn fence, single space,	9 12	Shoe, Steel, No. 1, 13 oz.	73	Galvanized....	65c—2 25
Belt (Carolus).		36-inch		Tack		Conductor.	
No. 0.....	\$2 50	Lawn fence, single space,	10 20	Magnetic,		Conductor hooks.....	20-10c
No. 1.....	3 25	32-inch	12 50	No. 5, each.....	1 00	Milcor.....	Net
No. 3.....	4 25	Lawn fence, double space,	12 50	HAMMERS, HEAVY.		Corn.	
CLIPS.		42-inch	13 75	Farriers'.....	20%	Common, riveted, red, per dz.	Net
Axle.....	65c 5%	Field fence, 26-inch, No. 10	26 50	Mason's.		Little Giant.....	Net
Damper.		Same, 6 filling.....	33 82	Single and Double Face.....	50%	Grass.	
Acme, with tail-pieces,		Field fence, 32-inch, No. 10	30 34	HANDLES.		Common Nos. 1.....	3 5 7
per doz.....	\$1 25	Same, 6 filling.....	39 41	Agricultural Tool.		Per doz. \$4 25 3 25 3 40 3 50	
Non Rivet tail pieces,		FILES AND RASPS.		4 1/2-inch, plain....per doz.	\$3 50	Hammock.	
per doz.....	25	Heller's (American).....	70%	Auger.		With plate.....per doz.	\$1 00
Non Rivet Clips.....	90	American.....	70%	Common Assorted, per doz.	\$0 75	With screw.....	25
Hame.....	50c	Black Diamond.....	50-10%	Pratt's Adjustable, Nos.		Picture.....	50% & 50% & 10%
COLLARS, STOVE PIPE.		Eagle.....	60-10%	1 & 2, per doz.....	6 00	Potato and Manure.....	Net
Lacquered.		Great Western.....	60 & 10%	Ives' Adjustable, per set	1 35	HOSE.	
Inches.....	5 6 7	Kearney & Foot.....	60 & 10%	Ax.		1/2-inch molded reel.....	13 1/2c
Fancy pattern,		McClellan.....	60 & 10%	Hickory, No. 1.....per doz.	3 00	1/2-inch 3 ply duck.....	13 1/2c
per doz.....	65c 75c \$4 00	Nicholson.....	50-10-10%	Hickory, No. 2.....	2 00	1/2-inch 4 ply duck.....	16c
COMPASSES.		Simonds.....	60%	1st quality, second growth	6 00	1/2-inch 5 ply multiple.....	10 1/2c
Carpenters'.....	15%	J. Barton Smith.....	50-10-5%	Special white, 2nd growth	4 50	IRONS.	
COPPERS—Soldering.		X F.....	Net List	Chisel.		Sad.	
Pointed Roofing.		FIRE POTS.		Hickory, Tanged, Firmer		Charcoal.....per doz.	\$11 00
3 lb. and heavier....per lb.	40c	Clayton & Lambert's—		Assorted.....per doz.	55c	Common, polished, per	
2 lb.....	45c	East of west boundary line of		Hickory, Socket Firmer,		100 lbs.....	7 75
1 1/2 lb.....	55c	Province of Manitoba, Canada,		Assorted.....per doz.	70c	No. 70 Asbestos.....	\$1 50 net
1 lb.....	60c	No. Dakota, So. Dakota, Ne-		Coal Pick.....	40%	No. 100.....	1 75 net
CORD.		braska, Kansas, Oklahoma,		Drifting Pick.....	40%	Common, nickel plated..	8 25
Picture.		Amarillo, San Angelo and La-		File, assorted.....per doz.	30c	Mrs. Pott's.	
White Wire.....	60 & 5%	redo, Texas.....	55%	Hammer and Hatchet.		No. 50 J. Enterprise, per set	Nets
Spot No. 7.....per lb.	65c	West of above boundary	52%	No. 1, per doz.....	\$0 30	No. 55 J.....	" "
Common, No. 7.....	40c	line.....	52%	Second growth hickory, per	1 20	No. 55 T.....	" "
COTTERS, SPRING.		Turner Brass Works—		doz.....	1 20	No. 55 T.....	" "
Brass.....per doz.	\$2 25	No. 43 Kerosene-Gasoline	Ea.	Hay and Manure Fork, Han-		JACKS.	
CUT-OFFS		Master Torch, 1 qt.....	\$5 40	diel, Strap and Ferrule..		Wagon.	
Standard gauge.....	35%	No. 48 Kerosene-Gasoline	6 73	Screw Driver.		Richard's No. 1..per doz.	\$15 80
26 gauge.....	20%	Master Torch, 1 qt.....	6 73	Assorted.....each	6c	Oliver,	
CUTTERS.		No. 95 Double Jet Torch,	6 95	Shovel and Spade.....	Net	Each.....	\$0 60 \$0 80
Glass.		Gasoline, 1 qt.....	6 95	HANGERS.		Nos.....	0 00
Red Devil.....	Net	No. 30 Kerosene-Gasoline	6 45	Matchless.....	Net	Standard,	
Ment.		Torch, 1 qt. (new line).	6 45	Reliable.....	Net	Each.....	\$0 60 \$1 00
Enterprise—Nos. 5.....	10 12	No. 33 Single Jet Gasoline	6 93	Richards.....	25%	Nos.....	1 2
Each.....	\$2 50 \$4 25 \$3 75	Torch, 1 qt.....	6 93	Garage Door.		Big Lift.....	40%
No. 22.....	32	Plumbers' Furnaces.		(See Garage Door Hdw.)		Tiger.....	40%
No. 22.....	32	No. 53 Galv. Iron Tank	6 75	Conductor Pipe.		KETTLES.	
No. 22.....	\$6 50 \$3 50	with Bulb, 7 pts.....	6 75	Ivan's Perfection.....	50%	Brass.....	15%
Pipe.		No. 53 Galv. Iron Tank	7 47	Milcor Perfection.....	Net	Cauldron.....	40c 5%
Saunders', Nos. 1.....	2 3	with Pump, 7 pts.....	7 47	Steel hangers.....	30%	Copper.....per lb.	27
Each.....	\$1 85 2 75 6 75	No. 56 Straight Side Steel	8 82	Triple twist wire.....	10%	Maslin.....	40c 10%
Slaw and Kraut.	Per doz.	Tank with Bulb, 7 pts.	8 82	Milcor Eclipse.....	Net	Sugar.....	50%
4-knife Kraut.....	\$20 00-55 00	No. 66 Straight Side Steel	9 54	Milcor Triplex.....	Net	KNIVES.	
3-knife Kraut,		Tank, with Pump, 7 pts.	9 54	Milcor Milwaukee.....	Net	Beet Topping.	
8x27 in.....	13 00-18 00	GALVANIZED WARE		HASPS.		Clyde, 9-in. Scimitar Blade,	
1-knife Slaw.....	2 50	Palls (Competition), 8-qt.....	1 65	Hinge, Wrought, with staples, Net		doz.....	25%
2-knife Slaw.....	3 00	10-qt.....	1 85	HATCHETS.		California.....	25%
Washer.....	11 00	12-qt.....	2 00	Size No. 2 extra quality	Per doz.	Butcher.....	
DAMPERS, STOVE PIPE.		14-qt.....	2 30	broad.....	\$16 00	Beechwood Handles, 6-inch	
Diamond.		Wash tubs, No. 1.....	5 30	Competitive Grade.....	13 00	blade.....	25%
6-inch.....per doz.	\$1 50	No. 2.....	6 00	No. 2 Warranted Shingling	12 00	Beechwood Handles, 7-inch	
DIGGERS.		No. 3.....	7 00	Competitive Forged.....	8 00	blade.....	25%
Post Hole.		GARAGE DOOR HARDWARE		HAY RACK BRACKETS		Beechwood Handles, 3-inch	
Iwan's Split Handle		Stanley.....	All net	Wenzelman's No. 1		blade.....	25%
(Eureka).		GAUGES.		per doz. sets	\$18 00	Cooper's Hoop.....	25%
4-ft. Handle....per doz.	15 00	Marking, Mortise, etc.....	Nets	Wenzelman's No. 2		Drawing.....	25%
7-ft. Handle....per doz.	20 00	Wire.....	25%	per doz. sets	19 20	Standard.....	25%
Iwan's Hercules pattern,		Disston's.....	25%	HINGES.		Adjustable.....	25%
per doz.....	18 00	GIMLETS.		Blind.		Barton's Carpenters'.....	25%
Dividers, Wing.....	25%	Discount.....	65% and 10%	Clark's Gravity		Hay.	
DRILLS.		GLASS.		No. 1.....per set	45c	Iwan's Solid Socket.....	25%
Bench.		Single Strength, A and B,	85%	No. 2.....	38c	Heath's.....	25%
Blacksmiths' Twist (New		all sizes.....	85%	Gate.		Iwan's Sickle Edge.....	25%
List).....	40%	Double Strength, A and B,	85%	Clarks.....	1 2 3	Iwan's Imp'd Serrated.....	25%
BREAST.		all sizes.....	85%	Hgs. & Lch, ea. 85c	1 10 2 40	Hedge.	
Millers Falls No. 12, per		GLUE.		Hinges only—		Challenge.....	25%
doz.....	\$45 50	Bulk.		Upper.....	\$1 25	Disston's No. 1.....	25%
Millers Falls No. 112, per		B Amber.....per lb.	35c	Lower.....	1 55	Putty.	
doz.....	32 00	A white.....	40c	Latches only—		Common.....	25%
HAND.		H. S. Amber.....	32c	No. 1.....each	28c	Lander's.....	25%
Goodell's Automatic.		Liquid.		No. 2.....	28c	Scraping.	
No. 01.....each	\$1 60	Army & Navy.....	40%	Screen Door.		Beech Handle.....	25%
No. 03.....	2 00	Le Page's.....	37 1/2%	1751—3x3.....doz.	\$2 00	Lander's.....	25%
Goodell-Pratt No. 4 1/2.....	3 00	List "A".....	37 1/2%	1752—2 1/2x2 1/2.....	1 95	KNOBES.	
Goodell-Pratt No. 379.....	4 00	List "B".....	35%	Spring.		Door.	
REELPROTECTING.		List "C".....	25%	Chicago.....Add 10% to list		Mineral.....per doz.	\$2 00
Goodell's.....	3 20	GREASE, AXLE.		Gem.....	25%	Porcelain.....	2 00
DRIVERS, SCREW.		Wood Boxes.		Matchless.....	40%	Jet.....	3 00
Standard.....	Nets	Frazer's.....per gro.	\$12 00	New Idea.....per gross	\$6 50	LADDERS.	
EAVES TROUGH.		Hub Lightning.....	7 50	Per 100 pairs with screws:		Step.	
75 and 15% of Standard List.		Wood Palls.		Light Strap Hinges, No. 3	\$12 00	Common, per ft.....	28c
Milcor.....	Net	Frazer's, 15 lb. \$1.00; 25 lb.		Heavy Strap Hinges, No. 4	15 75	Common, with Shelf, add 10c	
ELBOWS—Conductor Pipe.		\$1.50 each.		Light T Hinges.....No. 3	12 10	IXL.....	34c
Galvanized Steel, Tin and Terne		Hub Lightning, 15 lb. 90c; 25		Heavy T Hinges.....No. 4	20 00	Challenge, 6 to 9 ft.....	55c
Plain Round or Round Corrugated		lb. \$1.21 each.		Extra Heavy T Hinges.		10 to 16 ft.....	60c
2 to 6 inch, Std. gauge.....	65%	HAFTS, AWL.		No. 4.....	21 50	LANTERNS.	
2 to 6 inch, 26 gauge.....	45%	Brad.		Screw Hook and Strap.		Monarch tin, hot blast.....	\$ 25
2 to 6 inch, 24 gauge.....	15%	Common.....per doz.	\$0 35	6 to 12 in....per 100 lbs.	\$7 75	Dietz No. 2 cold blast....	13 00
Milcor.....	Net	Patent, plain top.....	60	12 to 20 in....	7 50	Best tubular.....	8 25
Square Corrugated.		Patent, leather top.....	80	22 to 36 in....	7 25	Competition lanterns No. 0	6 65
Standard gauge.....	50%	Sewing.....	24	Screw Hook and Eye.		tubular.....	6 65
26 gauge.....	35%	Common.....	24	1/2 in.....per doz. pair	\$2 00	LEATHER, LACE.	
Milcor.....	Net	Patent.....	55	3/4 in.....	3 50	Rawhide 1/2-inch.....100 ft.	\$2 00
ELBOWS—Stove Pipe.		HAMMERS, HANDLED.		1 in.....	5 00	1/2-inch.....	4 00
1-piece Corrugated, Uniform		Each, net		HOES.		LEATHERS, PUMP.	
6-inch.....	\$1 25	Blacksmiths', Hand, No. 0	\$1 35	Garden.....	Net	Valve and Plunger.....	Net
6-inch.....	1 40	26-oz.....	\$1 35	HOOKS.		LEVELS.	
7-inch.....	1 80	Engineers', No. 1, 26-oz.....	1 35	Awning, No. 60.....	Net	Disston, No. 22 Asmt.....	\$22 05
Special Corrugated.		Farriers', No. 7, 7-oz.....	1 41	Belt.....		No. 18, 20 in. each.....	1 35
6-inch.....	\$1 15	Mechanists', No. 1, 7-oz.....	1 06	Brown's.....	70c 5%	No. 22, 24 in. each.....	2 40
7-inch.....	1 60	Nail.....		Jones'.....	65c 5%	Shafting, 6 in.....	19 80
Uniform, Collar Adjustable		Vanadium, No. 41, 20-oz.....	1 45	Box.		6 in. gr. glass.....	34 20
6-inch.....	\$1 60	each.....	1 45	No.....	3 10 12	No. 1 Asmt.....	6 75
7-inch.....	2 25	Vanadium No. 41 1/2, 16-oz.....	1 45	Each.....	\$0 29 0 77 0 36	No. 9 Asmt.....	12 40
8-inch.....		each.....	1 45	Common Axe Handle,		24-26 in.each	1 02
6-inch.....	\$1 60	V. & B., No. 11 1/2, 16-oz.....	1 04	per doz.....	\$20 00	26-30 in.each	1 00
7-inch.....	2 25	each.....	1 04	Chain.		LIFTERS.	
8-inch.....		Garden City, No. 11 1/2, 16	77	Pr. 100 \$7 60-8 10 9 75 11 50 12 60		Stove Cover.	
7-inch.....		oz., each.....	77			Coppered.....per gro.	\$6 00
						Alaska.....	4 75
						Transom.....	
						Payson's.....	55%

LINES.		PAPER.		POINTS, GLAZIERS.		RIVETS.	
Jute	per lb. 25c	Roofing. Per square		No. 1, 2 and 3.....	per doz. 75c	Copper Belt	50% Discount
Sisal	" 35c	Mayor, 1-ply	\$1 33	POINTERS, SPOKE.		Coppered Iron	50%
Cotton	" 25c	" 2-ply	2 24	Stearns' No. 1	per doz. \$10 00	Tinners'	50%
Braided Cotton	" 62c	" 3-ply	2 65	No. 2	12 00	Hame	per lb. \$0 17
LINING, STOVE.		Red Rosin	per ton \$11 45	POKERS, STOVE.		Slotted Clinch per doz.	60 @ 1 10
Bricks	per crate 42c	Sand and Emery.		Wrt Steel, str't or bent,		Tubular.	
LOCKS.		No. 1 per ream, best grade	\$5 40	Nickel Plated, coil han's	" 1 10	Nos. 1 and 2 assorted sizes,	
Barn Door.		No. 1, per ream, cheaper	4 35	PRESSES, FRUIT AND JELLY		50 in box.....	doz. 75c
No. 60 Stearns.....	per doz. \$12 00	Potato.		Enterprise Manufacturing Co.	25%	Nos. 1 and 2 assorted sizes,	
No. 80	24 00	Goodell's Saratoga, 10 1/4		PRUNERS.		10 in box.....	doz. 1 40
MACHINES		in., doz.	6 50	Disston's Pole	per doz. \$18 00	ROPE.	
Riveting.		Goodell's Saratoga, 5 in.,	5 50	Water's Improved, per doz.	60%	Cotton.	
Stearns No. 1.....	per doz. \$16 00	PICKS.		PULLEYS.		1/4, 5-16 in. Com. on reels,	
Temoning.		Adze Eye Ore.....	22 1/2%	Awning-Jap'd	10%	per lb.	30c
No. 50 Peace's Spoke, each	\$16 00	Drifting and Poll Picks.....	22 1/2%	Clothes Line	10%	1/4, 5-16 in. Com. in coils,	
MALLETS.		Plumbs, Railroad	22 1/2%	Hay Fork.		per lb.	80c
Carpenters'.		Surface	22 1/2%	Iron Wheel, 5-in. per doz.	\$2 50	Sisal.	
Fibre Head, No. 2 per doz.	\$16 50	PINCERS.		Wood Wheel, 6-in. "	2 65	1st Quality, base 1 1/4c to 1 5/8c	
No. 3	19 50	Carpenters', cast steel,		Wood Wheel, 6-in.,	3 00	No. 2.....	13c to 14c
" No. 4	23 50	No.	6 10 12	pass knot	" 3 00	Manila.	
Round Hickory	per doz. \$3 00—5 00	Each \$0 56 0 72 \$0 93 \$1 03		SASH.		1st Quality standard	
MATS.		Blacksmiths', No. 10.....	\$0 95	Common	Net	brands	17 1/4c to 18 1/4c
Door.		Heller's	List plus 10%	Common-Sense, 2-in.	Net	No. 2	16c to 18 1/2c
National Rigid	5&10&5%	PINS		Empire Pattern, 2-in.	Net	Hardware Grade, per lb.	12 1/2c
Acme Steel Flexible.....	50%	Clothes.		Ideal	Net	Pure Manila.	
MEASURES.		Common, per box of 5 gro.	\$0 95	Steel	Net	1st Quality, base,	
Galvanized, doz.....	Nets	Picket.		PIPE.		per lb.	17 1/4c to 18 1/4c
Japanned, doz.....	Nets	Fluted, 15-in.	per doz. \$1 10	Plain Round and Round Corru-		Hardware Grade, per lb.	11 1/2c
MITRES.		Fluted, 21-in.	1 60	gated.		SAWS.	
Galvanized steel mitres, and		Spiral	1 90	29 Gauge	70&5%	Butchers'.	
caps, end pieces, outlets.....	30%	CONDUCTOR.		28 "	70&5%	Atkins No. 2, 14-in.	\$12 20
Milcor	Net	Plain Round and Round Corru-		26 "	70&5%	" No. 2, 18-in.	13 70
MOPS		gated.		24 "	70&5%	" No. 7, 16-in.	15 20
Cotton, Star (Cut Ends).		Square Corrugated A and B and		24 "	70&5%	" No. 2, 22-in.	15 25
Pounds 12' 15' 18' 24'-3-oz.		Octagon.		24 "	70&5%	" No. 7, 20-in.	17 30
Per doz. \$4 00 4 35 5 50 7 00		29 Gauge	70&5%	Prices for Galvanized Toncan		" No. 7, 24-in.	19 35
Enterprise	16 1/2%	28 "	70&5%	Metal, Genuine O. H. Iron, Lyon-		" No. 7, 28-in.	21 40
Parker	50&5%	26 "	70&5%	more Metal and Keystone C. B.		COMPASS.	
NAILS.		24 "	70&5%	on application.		Atkins No. 2, 10-in.	\$4 95
Cut Steel	\$4 45	24 "	70&5%	Plain Round and Round Corru-		" No. 10, 10-in.	5 10
Cut Iron	4 45	24 "	70&5%	gated.		" Blades, No. 2, 10-in.	2 95
Wire.		24 "	70&5%	29 Gauge	70&5%	" No. 2, 10-in.	3 00
Common	3 10	24 "	70&5%	28 "	70&5%	CROSS-CUT.	
Cement Coated.		24 "	70&5%	26 "	70&5%	Atkins No. 221, 4-ft.	2 70
Small Lots	2 65	24 "	70&5%	24 "	70&5%	" No. 221, 6-ft.	4 10
Horseshoe.		24 "	70&5%	24 "	70&5%	" No. 221, 8-ft.	5 45
Ausable	55&5%	24 "	70&5%	24 "	70&5%	FLOORING.	
Capwell	15%	24 "	70&5%	24 "	70&5%	Atkins No. 96, 16-in.	19 95
Perfect	55&5%	24 "	70&5%	24 "	70&5%	" No. 96, 20-in.	21 85
Putnam	30&5%	24 "	70&5%	24 "	70&5%	HAND AND RIP.	
Star	30&5%	24 "	70&5%	24 "	70&5%	Atkins No. 54, 20-in.	17 75
NETTING, POULTRY.		24 "	70&5%	24 "	70&5%	" No. 54, 26-in.	22 10
Galvanized before weaving.....	50%	24 "	70&5%	24 "	70&5%	" No. 53, 16-in.	16 45
Galvanized after weaving.....	40%	24 "	70&5%	24 "	70&5%	" No. 53, 20-in.	30 80
NIPPERS.		24 "	70&5%	24 "	70&5%	" No. 53, 24-in.	24 30
End Cutting.		24 "	70&5%	24 "	70&5%	" No. 53, 28-in.	28 60
Berg's (Swedish) In. 5	6	24 "	70&5%	24 "	70&5%	" No. 53, 30-in.	31 95
Per dozen.....	\$12 60 15 20	24 "	70&5%	24 "	70&5%	KEYHOLE.	
End and Diagonal Cutting.		24 "	70&5%	24 "	70&5%	Atkins No. 1, complete..	2 80
Berg's (Swedish) In. 5	6	24 "	70&5%	24 "	70&5%	" No. 2, complete..	3 35
Per dozen	\$10 95 13 00	24 "	70&5%	24 "	70&5%	MITER BOX.	
Hoof.		24 "	70&5%	24 "	70&5%	Atkins No. 1, 4x20.....	29 70
Heller's	40&10%	24 "	70&5%	24 "	70&5%	" No. 1, 5x22.....	24 55
V. & B., No. 52, each.....	\$2 25	24 "	70&5%	24 "	70&5%	" No. 1, 6x22.....	38 35
NOZZLES.		24 "	70&5%	24 "	70&5%	PRUNING.	
Hose.		24 "	70&5%	24 "	70&5%	Atkins No. 20, 12-in.	7 70
Magic	per doz. \$9 50	24 "	70&5%	24 "	70&5%	" No. 10, 16-in.	16 50
Diamond	5 75	24 "	70&5%	24 "	70&5%	WOOD.	
OILERS.		24 "	70&5%	24 "	70&5%	Atkins No. 202.....	8 50
Chase Pattern.		24 "	70&5%	24 "	70&5%	" No. 318.....	10 05
Brass and Copper	10%	24 "	70&5%	24 "	70&5%	" No. 906.....	15 65
Zinc	20%	24 "	70&5%	24 "	70&5%	" No. 318.....	15 65
Railroad.		24 "	70&5%	24 "	70&5%	" No. 1509.....	18 40
Coppered	33 1/2%	24 "	70&5%	24 "	70&5%	SCOOPS	
Steel.		24 "	70&5%	24 "	70&5%	Hubbard Western Pattern Riveted.	
Copper Plated	50-10-5%	24 "	70&5%	24 "	70&5%	Size A B C D	
OPENERS.		24 "	70&5%	24 "	70&5%	1. \$16 75 16 00 15 25 14 45	
Can.		24 "	70&5%	24 "	70&5%	4. 17 85 17 10 16 35 15 60	
Delmonico	per doz. \$1 30	24 "	70&5%	24 "	70&5%	6. 18 65 17 85 17 10 16 35	
Never Slip.....	65	24 "	70&5%	24 "	70&5%	SCRAPERS.	
CRATE.		24 "	70&5%	24 "	70&5%	Triangular No. 6 per doz.	\$6 25
V. & B.....	per doz. \$7 25-11 00	24 "	70&5%	24 "	70&5%	ROAD.	
PAIS.		24 "	70&5%	24 "	70&5%	Cubic ft.	7 5 3
Cream.		24 "	70&5%	24 "	70&5%	With runners, ea.	\$7 00 6 50 6 20
14-qt. without gauge,		24 "	70&5%	24 "	70&5%	SCREEN DOOR HINGES.	
per doz.	\$9 50	24 "	70&5%	24 "	70&5%	Cast Iron	gross \$13 00
18-qt. without gauge,		24 "	70&5%	24 "	70&5%	Steel	9 50
per doz.	11 00	24 "	70&5%	24 "	70&5%	SCREWS.	
20-qt. without gauge,		24 "	70&5%	24 "	70&5%	Bench.	
per doz.	11 75	24 "	70&5%	24 "	70&5%	Iron, Ins. 1 1 1/4 1 1/2	
SAP.		24 "	70&5%	24 "	70&5%	\$6 32 7 87 9 45 16 80	
10-qt. IC Tin.....	per doz. \$4 00	24 "	70&5%	24 "	70&5%	Wood, white maple, per doz.	6 00
12 "	5 50	24 "	70&5%	24 "	70&5%	Hand-Wood	50%
Stock.		24 "	70&5%	24 "	70&5%	Hand Rail	22%
Galv. qts. 14 16 18 20		24 "	70&5%	24 "	70&5%	Jack	30%
Per doz. \$9 75 10 75 12 75 14 50		24 "	70&5%	24 "	70&5%	Lag or Coach—all sizes,	
Water.		24 "	70&5%	24 "	70&5%	gimlet pointed	60%
Galvanized qts. 10 12 14		24 "	70&5%	24 "	70&5%	Saw—Centennial.	
Per doz.	\$5 75 6 50 7 25	24 "	70&5%	24 "	70&5%	Nos.	1 2 3 4
Wood.		24 "	70&5%	24 "	70&5%	Per doz.	47c 55c 75c 90c
Cable, 2-Hoop ...	per doz. Nets	24 "	70&5%	24 "	70&5%	WOOD.	
Cable, 3-Hoop ...	" Nets	24 "	70&5%	24 "	70&5%	F. H. Bright	82 1/2 & 20%
Cedar, 3-Hoop, brass "	" Nets	24 "	70&5%	24 "	70&5%	R. H. Blued	80 & 20%
PANS.		24 "	70&5%	24 "	70&5%	F. H. Jap'd	75 & 20%
Dripping	Net	24 "	70&5%	24 "	70&5%	F. H. Brass	77 1/2 & 30%
Fry.		24 "	70&5%	24 "	70&5%	R. H. Brass	75 & 20%
Common	Nets	24 "	70&5%	24 "	70&5%	SHEET METAL.	
Acme	"	24 "	70&5%	24 "	70&5%	No. 7, 1/4x1/4, per gross..	\$ 55
Roasting.		24 "	70&5%	24 "	70&5%	No. 10, 1/4x3/16 per gross..	. 75
Paxton.		24 "	70&5%	24 "	70&5%	No. 14, 1/4x1/4 per gross..	. 90
Nos.	1 2 3 4	24 "	70&5%	24 "	70&5%	SCYTHES.	
Per doz.	Nets	24 "	70&5%	24 "	70&5%	Clipper, Grass.....	per doz. \$13 50
Neverburn	"	24 "	70&5%	24 "	70&5%	Honest Dutchman	13 00
Savory, No. 300. per doz.	\$3 40	24 "	70&5%	24 "	70&5%		

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Meyers Mfg. Co., Fred J., Hamilton, Ohio
- Files.**
Heller Bros. Co., Newark, N. J.
- Furnace Rings.**
Walworth Run Fdy. Co., Cleveland, Ohio
- Garages—Metal.**
Thomas & Armstrong Co., The, London, Ohio
- Grates—Camp.**
Union Steel Products Co., Albion, Mich.
- Guards—Fire.**
Meyers Mfg. Co., Fred J., Hamilton, Ohio
- Hammers.**
Vaughan & Bushnell Mfg. Co., Chicago, Ill.
- Handles—Boiler.**
Berger Bros. Co., Philadelphia, Pa.
- Handles—File.**
Parker Supply Co., New York, N. Y.
- Hangers—Eaves Trough.**
W. C. Hopson Co., Grand Rapids, Mich.
- Heaters—Combination Hot Water.**
Melbye Bros. Co., Chicago, Ill.
- Heaters—School Room.**
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Meyer Furnace Co., Peoria, Ill.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Standard Furnace & Supply Co., Omaha, Neb.
- Heaters—Warm Air.**
American Furnace Co., St. Louis, Mo.
Carr Supply Co., Chicago, Ill.
Dunning Heating Supply Co., Milwaukee, Wis.
Farquhar Furnace Co., The, Wilmington, Ohio
Farris Furnace Co., Springfield, Ill.
Forest City Fdy. & Mfg. Co., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Hall-Neal Furnace Co., Indianapolis, Ind.
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess-Snyder Co., Massillon, Ohio
Independent Stove Co., Owosso, Mich.
Kruse Co., Indianapolis, Ind.
- Heaters—Warm Air—Continued**
Lamneck Co., W. E., Columbus, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Mahoning Fdy. Co., Youngstown, Ohio
Manny Heating Supply Co., Chicago, Ill.
Meyer Furnace Co., Peoria, Ill.
Michigan Stove Co., The, Detroit, Mich.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Illinois
Orbon Stove Co., Bellville, Illinois
Peerless Foundry Co., Indianapolis, Ind.
Scheible-Moncrief Heater Co., Cleveland, Ohio
Schwab & Sons Co., R. J., Milwaukee, Wis.
Standard Furnace & Supply Co., Omaha, Neb.
St. Louis Heating Co., St. Louis, Mo.
Utica Heater Co., Utica, N. Y.
Waterloo Register Co., Waterloo, Iowa
- Horse Shoes.**
American Steel & Wire Co., Chicago, Ill.
- Humidifiers.**
Haynes, Kansas City, Mo.
- Indoor Closet.**
Independent Reg. & Mfg. Co., Cleveland, Ohio
- Jobbers—Hardware.**
Bullard & Gormley Co., Chicago, Ill.
Clark-Smith Hardware Co., Peoria, Ill.
- Kitchen Utensils.**
Lalanc & Grosjean Mfg. Co., Chicago, Ill.
- Ladders.**
Walchli Mfg. Co., St. Louis, Mo.
- Lath—Expanded Metal.**
Milwaukee Corrugating Co., Milwaukee, Wis.
- Machines—Crimping.**
Bertsch & Co., Cambridge City, Ind.
- Machinery—Culvert.**
Bertsch & Co., Cambridge City, Ind.
- Machines—Razor Blades.**
Hyfield Mfg. Co., New York, N. Y.
- Machines—Stove Pipe.**
Hemp & Co., St. Louis, Mo.
- Machines—Tinsmiths'.**
Bertsch & Co., Cambridge City, Ind.
Drels & Krump Mfg. Co., Chicago, Ill.
Ewert & Kutscheid Mfg. Co., Chicago, Ill.
Hemp & Co., St. Louis, Mo.
Maplewood Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
- Mailing Lists.**
Ross-Gould, St. Louis, Mo.
- Metals—Perforated.**
Harrington & King Perforating Co., Chicago, Ill.
- Miters.**
Friedley-Voshardt Co., Chicago, Ill.
- Nails—Slatting.**
Hussey & Co., C. G., Pittsburgh, Pa.
- Nails—Wire.**
American Steel & Wire Co., Chicago, Ill.
- Ornaments—Sheet Metal.**
Friedley-Voshardt Co., Chicago, Ill.
Geroch Bros. Mfg. Co., St. Louis, Mo.
- Patterns—Furnace and Stove.**
Cleveland Castings Pattern Co., Cleveland, Ohio
Quincy Pattern Co., Quincy, Ill.
Shaw & Son Co., The Geo. E., Cleveland, Ohio
Vedder Pattern Works, Troy, N. Y.
- Penicils.**
Eagle Penicil Co., New York, N. Y.
- Pipe and Fittings—Furnace.**
Carr Supply Co., Chicago, Ill.
Dunning Heating Supply Co., Milwaukee, Wis.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck Co., W. E., Columbus, Ohio
Manny Heating Supply Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Standard Furnace & Supply Co., Omaha, Neb.
- Pipe and Fittings—Stove.**
Hemp & Co., St. Louis, Mo.
Meyer & Bro. Co., F., Peoria, Ill.
Sullivan-Geiger Co., Indianapolis, Ind.
- Pipe—Conductor.**
Berger Bros. Co., Philadelphia, Pa.
Burton Co., W. J., Detroit, Mich.
Clark-Smith Hdw. Co., Peoria, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Hussey & Co., C. G., Pittsburgh, Pa.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
New Jersey Zinc Co., The, New York, N. Y.
- Polish—Metal and Stove.**
Black Silk Stove Polish Works, Sterling, Ill.
- Posts—Steel Fence.**
American Steel & Wire Co., Chicago, Ill.
- Punches.**
Bertsch & Co., Cambridge City, Ind.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
- Punches—Combination Bench and Hand.**
Parker Supply Co., New York, N. Y.
Whitney Metal Tool Co., Rockford, Ill.
- Punches—Hand.**
Parker Supply Co., New York, N. Y.
Whitney Metal Tool Co., Rockford, Ill.
- Quadrants—Damper.**
Parker Supply Co., New York, N. Y.
- Racks—Canning.**
Union Steel Products Co., Albion, Mich.
- Racks—Stove.**
Union Steel Products Co., Albion, Mich.
- Radiator Hoods and Shells—Ford.**
Messenger & Parks Mfg. Co., Aurora, Ill.
- Ranges—Combination Gas & Coal.**
American Stove Co., St. Louis, Mo.
- Independent Stove Co., Owosso, Mich.**
Malleable Iron Range Co., Beaver Dam, Wis.
Matthews Banner Range Co., South Bend, Ind.
Quick Meal Stove Co., St. Louis, Mo.
- Ranges—Gas.**
American Stove Co., St. Louis, Mo.
Clark & Co., Geo. M., Chicago, Ill.
Dangler Stove Co., Cleveland, O.
Matthews Banner Range Co., South Bend, Ind.
Quick Meal Stove Co., St. Louis, Mo.

Haps.

Heller Bros., Newark, N. J.

Register Shields.

Hall-Neal Furnace Co., Indianapolis, Ind.

Registers—Warm Air.Carr Supply Co., Chicago, Ill.
Dunning Heating Supply Co., Milwaukee, Wis.

Hart & Cooley Co., New Britain, Conn.

Henry Furnace & Fdy. Co., Cleveland, Ohio

Majestic Co., Huntington, Ind.

Manny Heating Supply Co., Chicago, Ill.

Rock Island Register Co., Rock Island, Ill.

Standard Furnace & Supply Co., Omaha, Neb.

Stearns Register Co., Detroit, Mich.

Tuttle & Bailey Mfg. Co., Chicago, Ill.

Walworth Run Fdy. Co., Cleveland, Ohio

Waterloo Register Co., Waterloo, Iowa

Regulators—Damper.

Parker Supply Co., New York, N. Y.

Repair Parts—Auto Radiator.

Curfman Mfg. Co., F. L., Maryville, Mo.

G. & O. Mfg. Co., New Haven, Conn.

Repairs—Stove & Furnace.

Hessler Co., H. E., Syracuse, N. Y.

Ridging.

American Rolling Mill Co., Middletown, Ohio

Rivets—Stove.

Kirk-Latty Mfg. Co., Cleveland, Ohio

Roasters.

Lalanc & Grosjean Mfg. Co., Chicago, Ill.

Rod Clips—Damper.

Parker Supply Co., New York, N. Y.

Rods—Stove.

Kirk-Latty Mfg. Co., Cleveland, Ohio

Rolls—Forming.

Bertsch & Co., Cambridge City, Ind.

Roof—Flashing

Hessler Co., H. E., Syracuse, N. Y.

Roofing—Iron and Steel.

American Rolling Mill Co., Middletown, Ohio

Burton Co., W. J., Detroit, Mich.

Cortright Metal Roofing Co., Philadelphia, Pa.

Friedley-Voshardt Co., Chicago, Ill.

Milwaukee Corrugating Co., Milwaukee, Wis.

Osborn Co., The J. M. & L. A., Cleveland, Ohio

Inland Steel Co., Chicago, Ill.

Sykes Co., The Chicago, Ill.

Roofing—Zinc.

Illinois Zinc Co., New York, N. Y.

New Jersey Zinc Co., The New York, N. Y.

Rubbish Burners.

Hart & Cooley Co., New Britain, Conn.

Saws.

Atkins & Co., Inc., E. C., Indianapolis, Ind.

Schools—Sheet Metal Trades.

Zideck School of Sheet Metal Trades, New York, N. Y.

Schools—Sheet Metal Pattern Drafting.

St. Louis Technical Institute, St. Louis, Mo.

Zideck Auto Radiator School, New York, N. Y.

Schools—Automobile Radiator Repairing.

Zideck Auto Radiator School, New York, N. Y.

Screens—Perforated Metal.

Harrington & King Perforating Co., Chicago, Ill.

Screws—Sheet Metal.

Parker Supply Co., New York, N. Y.

Screw Drivers.

North Bros. Mfg. Co.,

Shears—Hand and Power.

Ewert & Kutscheid Mfg. Co., Philadelphia, Pa.

Marshalltown Mfg. Co., Marshalltown, Iowa

Viking Shear Co., Erie, Pa.

Sheets—Asbestos

Manny Heating Supply Co., Chicago, Ill.

Sheets—Black and Galvanized.

American Rolling Mill Co., Middletown, Ohio

Inland Steel Co., Chicago, Ill.

Osborn, The J. M. & L. A., Cleveland, Ohio

Sykes Co., The Chicago, Ill.

Sheets—Iron.

American Rolling Mill Co., Middletown, Ohio

Shields—Radiator.

Thomas & Armstrong Co., The London, Ohio

Shingles—Zinc.

Illinois Zinc Co., New York, N. Y.

Sifters—Ash.

Diener Mfg. Co., G. W., Chicago, Ill.

Sifters—Flour.

Meyers Mfg. Co., Fred J., Hamilton, Ohio

Sky Lights.

Burton Co., W. J., Detroit, Mich.

Messinger & Parks Mfg. Co., Aurora, Ill.

Sykes Co., The Chicago, Ill.

Smoke Pipe—Cast Iron.

Manny Heating Supply Co., Chicago, Ill.

Waterloo Register Co., Waterloo, Iowa

Solder.

Chicago Solder Co., Chicago, Ill.

Soldering Furnaces.

Ashton Mfg. Co., Newark, N. J.

Berns Co., Otto, Newark, N. J.

Burgess Soldering Furnace Co., Columbus, Ohio

Clayton & Lambert Mfg. Co., Detroit, Mich.

Diener Mfg. Co., G. W., Chicago, Ill.

Double Blast Mfg. Co., North Chicago, Ill.

Hones, Inc., Chas. A., Baldwin, Long Island, N. Y.

Quick Meal Stove Co., St. Louis, Mo.

Turner Brass Works, Sycamore, Ill.

Specialties—Hardware.

Atkins & Co., Inc., E. C., Indianapolis, Ind.

Bullard & Gormley, Chicago, Ill.

Diener Mfg. Co., G. W., Chicago, Ill.

Hardware Specialty Co., Fort Wayne, Ind.

Heller Bros. Co., Newark, N. J.

Hessler Co., H. E., Syracuse, N. Y.

Hyfield Mfg. Co., New York, N. Y.

Lovell Mfg. Co., Erie, Pa.

Parker Supply Co., New York, N. Y.

Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Walchli Mfg. Co., St. Louis, Mo.

Sporting Goods.

Bullard & Gormley, Chicago, Ill.

Stains—Oil and Acid.

Federal Varnish Co., Chicago, Ill.

Stars—Hard Iron Cleaning.

Fanner Mfg. Co., Cleveland, Ohio

Statuary.

Friedley-Voshardt Co., Chicago, Ill.

Gerock Bros. Mfg. Co., St. Louis, Mo.

Stoves—Camp.

Quick Meal Stove Co., St. Louis, Mo.

Union Steel Products Co., Albion, Mich.

Stoves—Gasoline and Kerosene.

American Stove Co., St. Louis, Mo.

Clark & Co., Geo. M., Chicago, Ill.

Dangler Stove Co., Cleveland, O.

Quick Meal Stove Co., St. Louis, Mo.

Stoves and Ranges.

American Stove Co., St. Louis, Mo.

Clark & Co., Geo. M., Chicago, Ill.

Clinton Furnace Stove Co., Clinton, Ind.

Copper Clad Malleable Range Co., St. Louis, Mo.

Dangler Stove Co., Cleveland, O.

Gohman Bros. & Kahler, New Albany, Ind.

Independent Stove Co., Owosso, Mich.

Jungers Stove & Range Co., Grafton, Wis.

Malleable Iron Range Co., Beaver Dam, Wis.

Michigan Stove Co., The Detroit, Mich.

Orbon Stove Co., Belleville, Ind.

Quick Meal Stove Co., St. Louis, Mo.

Stove Pipe Reducer.

Sullivan-Geiger Co., Indianapolis, Ind.

Tacks, Staples, Spikes.

American Steel & Wire Co., Chicago, Ill.

Tiles and Shingles—Metal.

Burton Co., W. J., Detroit, Mich.

Cortright Metal Roofing Co., Philadelphia, Pa.

Hopson Co., W. C., Grand Rapids, Mich.

Illinois Zinc Co., New York, N. Y.

Milwaukee Corrugating Co., Milwaukee, Wis.

Thomas & Armstrong Co., The London, Ohio

Tinplate.

Osborn Co., The J. M. & L. A., Cleveland, Ohio

Tin—Perforated.

Harrington & King Perforating Co., Chicago, Ill.

Tools—Auto Repair.

Curfman Mfg. Co., F. L., Maryville, Mo.

Tools—Carpenter.

Atkins & Co., Inc., E. C., Indianapolis, Ind.

Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Tools—Tinsmith's.

Bertsch & Co., Cambridge City, Ind.

Dreis & Krump Mfg. Co., Chicago, Ill.

Ewert & Kutscheid Mfg. Co., Chicago, Ill.

Hopson Co., W. C., Grand Rapids, Mich.

Maplewood Machinery Co., Chicago, Ill.

Marshalltown Mfg. Co., Marshalltown, Iowa

Osborn Co., The J. M. & L. A., Cleveland, Ohio

Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Viking Shear Co., Erie, Pa.

Whitney Mfg. Co., W. A., Rockford, Ill.

Whitney Metal Tool Co., Rockford, Ill.

Torches.

Ashton Mfg. Co., Newark, N. J.

Berns Co., Otto, Newark, N. J.

Burgess Soldering Furnace Co., Columbus, Ohio

Clayton & Lambert Mfg. Co., Detroit, Mich.

Diener Mfg. Co., G. W., Chicago, Ill.

Double Blast Mfg. Co., North Chicago, Ill.

Hones, Inc., Chas. A., Baldwin, Long Island, N. Y.

Quick Meal Stove Co., St. Louis, Mo.

Turner Brass Works, Sycamore, Ill.

Transit Companies.

Cleveland & Buffalo Transit Co., Cleveland, Ohio

Trimming—Stove.

Fanner Mfg. Co., Cleveland, Ohio

Valves—Humidifier.

Haynes, Kansas City, Mo.

Varnishes.

Cornish & Co., J. B., Chicago, Ill.

Federal Varnish Co., Chicago, Ill.

Ventilators.

Berger Bros. Co., Philadelphia, Pa.

Friedley-Voshardt Co., Chicago, Ill.

Messenger & Parks Mfg. Co., Aurora, Ill.

Milwaukee Corrugating Co., Milwaukee, Wis.

Standard Ventilator Co., Lewisburg, Pa.

Thomas & Armstrong Co., The London, Ohio

Ventilators—Ceiling.

Hart & Cooley Co., New Britain, Conn.

Henry Furnace & Fdy. Co., Cleveland, Ohio

Tuttle & Bailey Mfg. Co., New York

Water Heaters—Oil Burning.

Dangler Stove Co., Cleveland, O.

Wire.

American Steel & Wire Co., Chicago, Ill.

Wrenches.

Coos Wrench Co., Worcester, Mass.

Wringers—Clothes.

Lovell Mfg. Co., Erie, Pa.

Zinc.

Illinois Zinc Co., New York, N. Y.

New Jersey Zinc Co., The New York, N. Y.

Zinc—Slab.

Illinois Zinc Co., New York, N. Y.

WANTS AND SALES

For paid yearly subscribers, **AMERICAN ARTISAN AND HARDWARE RECORD** will insert under this head advertisements of not more than fifty words **WITHOUT CHARGE**. Employers wishing to secure employees, parties desiring to purchase or sell business, secure partners, or to exchange, etc., will find that these pages offer excellent opportunities to satisfy their wants. Clerks and tinsmiths looking for situations will find it to their advantage to use these columns. Those who respond to these announcements please mention that they "READ THE ADVERTISEMENT IN AMERICAN ARTISAN AND HARDWARE RECORD."

BUSINESS CHANCES

Lightning Rods—Sell our famous Copper Cable and Section Rods—endorsed and labeled by Underwriter's Laboratories. Special Patented One Piece Air Terminals—and many other exclusive features with Rock Bottom Prices. Don't do all the hard work and let your competitor put on the rods. Write today for agency. **L. K. DIDDIE CO., Marshfield, Wis.**

Business Chances—Hardware and sheet metal men who are free to go into a new thing, will find it profitable to write for particulars. Address Zarco, 407 East 91st Street, New York, N. Y. 2-3t

Wanted—Stock of hardware about \$6,000. I have 80 acres unimproved farm near Wadena, Minnesota, as part payment. Balance cash. Minnesota preferred. Address August Ebert, Truman, Minnesota. 3-3t

For Sale—Patent rights for adjustable flue and ventilator base. Fits any pitched roof. Can be carried in stock by hardware dealers as any one can erect it. Address B-36, care of **AMERICAN ARTISAN**, 620 So. Michigan Avenue, Chicago. 24-3t

For Sale—A well equipped sheet metal, heating and auto-radiator shop doing a good business in a Central Nebraska town. Tools and stock will invoice \$1,000, but for quick sale will take \$800 cash, or will consider terms. Address 1010 10th Avenue, Broken Bow, Nebraska. 2-3t

For Sale—Tin radiator and plumbing shop fully equipped with tools. Good town with population of 3,000. Only shop there, and do a good business, but must sell on account of other interests. Address B-40, care **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago. 25-3t

For Sale—Good going hardware business in town of 1,500 population in Northern Illinois. Last year business \$22,000. Stocks and fixtures about \$8,000, will reduce to suit purchaser. For particulars write B-51, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 3-3t

For Sale—Sheet metal shop, hardware, gas, electric supplies. Will sell at inventory (about \$3,000). Good chance for young or middle aged man with pep. Portable garage and auto for sale if desired. Business is located at 11821 Euclid Avenue, Cleveland, Ohio, the main street of city. Address Wall Mfg. Co., that address. 25-3t

For Sale—Good sheet metal and roofing shop with full equipment for handling No. 10 and lighter iron. Best town in East Central Illinois. Lots of building here. Fine opportunity for party or parties used to running a large shop. Will invoice from \$5,000 to \$7,000. Reason for selling, disagreement of partners. Have been established 12 years. Address B-44, care **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago. 1-3t

BUSINESS CHANCES

For Sale or Rent—Good tin shop with good tools of all kinds. Some stock. Will sell stock and rent tools. **E. R. Gardner, Monticello, Indiana.** 1-3t

For Sale—First class sheet metal radiator and oxy-acetylene welding shop, fully equipped. Always plenty of work. Reason for selling, poor health. Will invoice about \$1,800. Address B-48, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 3-1t

For Sale—Tin and radiator repair shop, plenty of work, good country. Only shop in town. Must sell at once on account of other business. Good tools, some new. 9 miles to nearest town. \$300 cash takes it including stock and tools. A real bargain. **Earl Poorman, Fulton, Indiana.** 3-3t

For Sale—Portable Bake, Japanning and Enameling Oven business; also sheet metal works. Established 35 years. 20 years at present location. Ovens sold all over the United States. Best chance for live party. Address B-43, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 3-1t

Business Chances—We will rent one-half of our sales room to a reliable party who wishes to put in a stock of Sporting Goods. Best location in the city of 38,000 population. Very little competition. Write for particulars. Address B-45, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 2-3t

For Sale—Sheet metal, heating and auto radiator shop, only shop in city of 3,800; located in Northern Idaho on Lake Pend d'Oreille. Best location for shop in North West. Tools and stocks complete will invoice \$1,300 to \$1,400 or will lump. Reasons for selling, other business out of city demand all my time. Cheap rent. Shop 30 by 65, living rooms in connection. Address G. R. Allen, 502 North 3rd Avenue, Sandpoint, Idaho. 2-3t

HELP WANTED

Wanted—Two first class sheet metal workers. Wages \$1 per hour. **Mehl Bros., 807 Union Street, Coffeyville, Kansas.** 1-3t

Wanted—Experienced steam fitter or plumber. For particulars address **White Plumbing and Heating Co., Charleston, Illinois.** 1-3t

Wanted—Tinner and furnace man. Must be willing to work. Good wages for right man. Call or write, 129 State Street. **Wauwatosa, Wisconsin.** 3-3t

Wanted—One sheet metal worker for inside work, also first class man for outside work. Address **E. C. Boorn Co., 20 East Franklin Street, Warren, Ohio.** 2-3t

Wanted—Two first class sheet metal workers for inside work on furnace fittings. Steady work to the right kind of men. **Hero Furnace Company, Sycamore, Illinois.** 3-3t

Wanted—Tinner, plumber and radiator man. Steady position for first class man. State wages wanted and experience in first letter. **Denkman Hardware Co., Geddes, South Dakota.** 1-3t

Wanted—Experienced furnace man. One who can lay out, figure, sell and install furnaces. This is a real job for the right man. Address **O. H. Bergeman, 109 Clinton Street, Wausau, Wisconsin.** 1-3t

Wanted—Practical sheet metal worker; one capable of drawing up a set of blueprints and also cutting out a pattern for metal work going into my incubator. Address **John G. Poorman, Tinley Park, Illinois.** 3-3t

Wanted—A good tinner to do repair work in shop and help in hardware shop. Good job for elderly man on outside work, steady job for right man. Address B-49, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 3-1t

Wanted—Tinner, one who can work from blue prints, on ventilating ducts and do furnace work. Small town 15 miles from Fort Wayne, Indiana, good lake 2 miles out. State wages and hours in first letter. **Churubusco Tin and Cor-nice Works, Churubusco, Indiana.** 3-3t

SITUATION WANTED

Wanted—Two sheet metal workers. Good job for right men. **Warning Sheet Metal Company, Oshkosh, Wisconsin.** 2-3t

Situation Wanted—By a plumber and steam fitter, who can also install warm air furnaces and do some tin work. Twenty years' experience. Address B-37, care **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago. 25-3t

Situation Wanted—Experienced hardware man with family wants position in retail hardware store as manager, assistant or salesman. Best references as to reliability and capability. Address B-50, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 3-1t

Situation Wanted—By tinner and furnace man, have had 14 years' experience. Can also do radiator work. 33 years old, married and want steady employment. Address B-46, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 2-3t

Situation Wanted—By an all around man with 20 years' experience at plumbing, hot water, steam, warm air heating, and in and outside tin work. Am 38 years old and married. Carry an Illinois license. Would like a steady position. Address B-47, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 2-3t

Situation Wanted—As superintendent of large jobbing shop, or large sheet metal factory. Competent to handle large plant—metal stamping tool and die work, piece work systems, automotive metal work, ventilating, estimating and designing. Furnace fittings, registers, enamelling and plating. Long record as an executive in several cities and large plants. State conditions and requirements. Address B-38, care **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago. 25-3t

TINNERS' TOOLS

Wanted—To Buy—One 8 foot brake and one No. 2 Whitney Lever Punch in good condition, for cash. **H. A. Duncan, 726 North Ervay Street, Dallas, Texas.** 3-3t

Wanted—One 2nd hand cornice crimper. Roll 6" in diameter, length 42". Must be cheap and in first class condition. Address **Harry T. Klugel, North Emporia, Virginia.** 2-3t

SPECIAL NOTICES

Special Notices—displayed want ads—are charged at the rate of \$3.00 per inch per insertion.

PATENTS
HUBERT E. PECK
Patent Attorney
Pacific Building, WASHINGTON, D. C.

STOVE SALESMAN WANTED

Foundry located on Mississippi river. Address D-28, care of **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois. 3-1t

WANTED

10 foot power square shear cut No. 16 and lighter. Must be in perfect condition. Quote price f. o. b. St. Louis. Address **Haynes-Langenberg Manufacturing Company, St. Louis, Missouri.** 24-1t